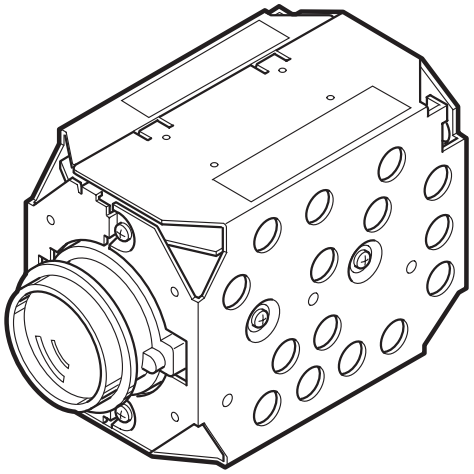
HITACHI

TK | No. 8104E

SERVICE MANUAL

VK-S274/S274E
VK-K274/K274E



SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

COLOR & B/W VIDEO CAMERA

September 2001 Digital Media Products Division,Tokai

Cautions

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for a higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual. Electrical components having such features are identified by marking with a ⚠ on the schematics and the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies for, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

How to discriminate the "TYPE" identifications in the manual

The parts and circuits are identified by "TYPE" in this manual to discriminate the differences between models. The TYPE numbers are the same as the model numbers. The table below shows how to read the type identifications.

TYPE identification	Model name
TYPE S	VK-S274
TYPE SE	VK-S274E
TYPE K	VK-K274
TYPE KE	VK-K274E

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Notes When Using Service Manual

The following shows the contents to be noted when using service manual:

1. Value units used in parts list

Certain symbols are indicated below for value units of resistors, capacitors and coils in parts list. When you read them note the following regular indications:

Parts	Indication in list	Regular indication
Resistor	KOHM	kΩ
Capacitor	UF	μF
	PF	pF
Coil	UH	μH
	MH	mH

2. Values in schematic diagrams

The values, dielectric strength (power capacitance) and tolerances of the resistors (excluding variable resistors) and capacitors are indicated in the schematic diagrams using abbreviations.

[Resistors]

Item	Indication
Value	No indication ····· Ω K ····· kΩ M ····· MΩ
Tolerance	No indication ····· ±5% (All tolerances other than ±5% are indicated in schematic diagrams)
Power capacitance	No indication ····· 1/8W (1/16W for leadless resistors without indication) All capacitances other than the above are indicated in schematic diagrams.

[Capacitors]

Item	Indication
Value	No indication ····· μF P ····· pF
Dielectric strength	No indication ····· 50V (All dielectric strengths other than 50V are indicated in schematic diagrams)

[Coils]

Item	Indication
Value	μ ····· μH m ····· mH

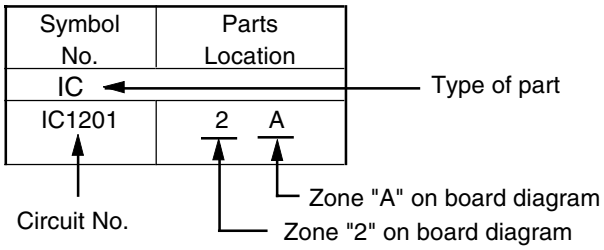
3. Identifications of sides A/B in circuit board diagrams

1) Board having a pattern on one side and parts on both sides.
   Side A: Shows discrete parts, viewed from the pattern side.
   Side B: Shows leadless parts, viewed from the pattern side.
2) Board having patterns on both sides and parts on both sides.
   Side A: Shows parts and patterns which can be seen when the case is opened.
   Side B: Shows parts and the pattern on the back of side A.

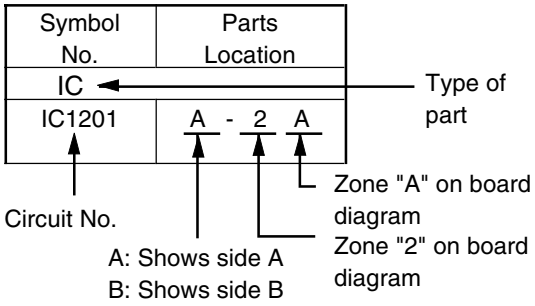
4. Table for indexing locations of parts

This table shows locations of each part on circuit board diagrams. The locations are indicated using the guide scales on the external lines of diagrams.

1) One diagram indicated for each board



2) Two diagrams indicated for each board



Contents

CHAPTER 1 GENERAL INFORMATION

1. Specifications ····· 1-1
2. Comparison with Previous Model ····· 1-2
   2.1 Comparison of Specifications ····· 1-2
   2.2 Comparison of ICs ····· 1-2

CHAPTER 2 DISASSEMBLY

1. Procedure ····· 2-1

CHAPTER 3 ELECTRIC CIRCUIT ADJUSTMENT

1. Test Equipment/Jigs Necessary for Adjustment ···· 3-1
   1.1 List of Equipment and Jigs ····· 3-1
   1.2 List of Charts for Adjustment ····· 3-1
   1.3 Test Equipment, etc. ····· 3-1
2. Before Stating Adjustment ····· 3-2
   2.1 Connections for Adjustment ····· 3-2
   2.2 Notes ····· 3-2
   2.3 Setting Test Equipment ····· 3-3
3. List of Adjustment Items ····· 3-4
4. Starting Adjustment Program (SMAP) ····· 3-5
5. Data Initilize Procedure ····· 3-6
   5.1 Data Initilize ····· 3-6
6. Electronic Volume Adjustment Procedure ····· 3-7
   6.1 CDS Sampling Pulse Adjustment ····· 3-7
7. Camera Adjustment (Adjustment) Procedure ····· 3-8
   7.1 Auto Iris Control Adjustment ····· 3-8
   7.2 Matrix Adjustment [For TYPE S/SE] ····· 3-8
   7.3 White Balance Adjustment [For TYPE S/SE] ·· 3-9
   7.4 Chroma Gain Adjustment [For TYPE S/SE] ···· 3-10
8. Autofocus Adjustment Procedure ····· 3-11
   8.1 Zoom/Focus Tracking Adjustment ····· 3-11
   8.2 AF Noise Level Adjustment ····· 3-12
   8.3 Check of Zoom Trace ····· 3-12
9. Spot Noise Adjustment Procedure ····· 3-13
   9.1 Spot noise Adjustment ····· 3-13
10. Error Messages ····· 3-14
   10.1 Error massage of Electronic Volume and Camera Adjustment ····· 3-14
   10.2 Error massage of Autofocus Adjustment ····· 3-15
   10.3 Error massage of Spot Noise Adjustment ····· 3-15
   10.4 Troubleshooting of Autofocus ····· 3-16
   (1) No zoom and focus operation ····· 3-16
   (2) No focus lens operation ····· 3-18
   (3) No zoom operation ····· 3-19
   (4) No autofocus operation ····· 3-20
   (5) Subject is greatly out-of-focus when zoomed ····· 3-21

CHAPTER 4 EXPLODED VIEW

1. Exploded View ····· 4-1

CHAPTER 5 REPLACEMENT PARTS LIST

1. Mechanical Parts List ····· 5-1
2. Electrical Parts List ····· 5-2

CHAPTER 6 SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS/MICROPRO CESSOR PIN FUNCTION TABLES

■ Schematic Diagrams

Connection Diagram ····· 6-1
Waveforms ····· 6-1
Sensor [SP] ····· 6-2
Process [PC] (For Display) ····· 6-3
Process [PC] (For Printing) <A-a> ····· 6-4
Process [PC] (For Printing) <A-b> ····· 6-5
Switching Regulator [CSR] ····· 6-6

■ Circuit Board Diagrams

PC -Side A/B- ····· 6-9
Identification of Parts Location ····· 6-7
SP -Side A/B- ····· 6-10
Identification of Parts Location ····· 6-7
CSR -Side A/B- ····· 6-10
Identification of Parts Location ····· 6-8

■ Block Diagrams

Overall ····· 6-11

■ Microprocessor Pin Function Tables

Digital Microprocessor (IC1201: D-µP) ····· 6-12

CHAPTER 1 GENERAL INFORMATION

1. Specifications

Note: The specifications are subject to change for improvement without notice.

Signal	VK-S274:	NTSC Format	
	VK-S274E:	PAL Format	
	VK-K274:	EIA Format	
	VK-K274E:	CCIR Format	
Scanning System	2:1 Interlaced		
Image Sensor	4.5 mm Dia. (1/4-inch) CCD Image Sensor		
Number of Effective Pixels	VK-S274/K274:	380 k [786 (H) × 494 (V)]	
	VK-S274E/K274E:	440 k [752 (H) × 582 (V)]	
Total Number of Pixels	VK-S274/K274:	410 k [811 (H) × 508 (V)]	
	VK-S274E/K274E:	470 k [795 (H) × 596 (V)]	
Scanning Frequency	VK-S274/K274:	Horizontal	15.734 kHz
		Vertical	59.94 Hz
	VK-S274E/K274E:	Horizontal	15.625 kHz
		Vertical	50 Hz
Lens	F1.6 to 3.8 (4 to 88 mm) 22 : 1 power zoom lens with autofocus		
Video Signal Output	VK-S274/S274E:	Composite Signal 1.0 Vp-p	
	VK-K274/K274E:	Y (Luminance) Signal 1.0 Vp-p	
Minimum Required Illumination	VK-S274/S274E:	Standard	1.0 lx
		DS shutter	0.1 lx
	VK-K274/K274E:	Standard	0.1 lx
		DS shutter	0.01 lx
S/N Ratio	50 dB or more		
Horizontal Resolution	470 TV Line or more		
Operating Temperature	0 to 60 °C		
Operating Humidity	10 to 90 %		
Power Input	DC 9 V ± 0.5 V		
Power Consumption	3.3 W or less		
Dimensions	50 (W) × 60 (H) × 89.5 (D) mm		
Weight	Approx. 225 g		

2. Comparison with Previous Model

2.1 Comparison of Specifications

ITEM	VK-S274/VK-S274E VK-K274/VK-K274E	VK-S234/VK-S234E VK-K234/VK-K234E
Signal Format	VK-S274: NTSC VK-S274E: PAL VK-K274: EIA VK-K274E: CCIR	VK-S234: NTSC VK-S234E: PAL VK-K234: EIA VK-K234E: CCIR
Power Requirements	DC 9 V	
Power Consumption	3.3 W (MAX)	
Dimensions (W × H × D mm)	50 × 60 × 89.5	
Weight	Approx. 225 g	
Lens	Power zoom × 22 (4.0 - 88.0 mm) F 1.6	
Operating Temperature/Humidity	0 °C to 60 °C (Recommendation: 0 °C to 40 °C) 10 % to 90 %	
Image Sensor	4.5mm Dia. (1/4 inch) CCD	
Number of Effective Pixels	VK-S274/K274: 786 (H) × 494 (V) VK-S274E/K274E: 752 (H) × 582 (V)	VK-S234/K234: 768 (H) × 494 (V) VK-S234E/K274E: 752 (H) × 582 (V)
Total Number of Pixels	VK-S274/K274: 811 (H) × 508 (V) VK-S274E/K274E: 795 (H) × 596 (V)	VK-S234/K234: 811 (H) × 508 (V) VK-S234E/K234E: 795 (H) × 596 (V)
Scanning System	2 : 1 Interlaced	
Horizontal Scanning Frequency	VK-S274/K274: 15.734 kHz VK-S274E/K274E: 15.625 kHz	VK-S234/K234: 15.734 kHz VK-S234E/K234E: 15.625 kHz
Vertical Scanning Frequency	VK-S274/K274: 59.94 Hz VK-S274E/K274E: 50 Hz	VK-S234/K234: 59.94 Hz VK-S234E/K324E: 50 Hz
Sync Format	Internal/External	
Video Signal Output	VK-S274/S274E: Composite Signal 1.0 Vp-p VK-K274/K274E: Y (Luminance) Signal 1.0Vp-p	VK-S234/S234E: Composite Signal 1.0 Vp-p VK-K234/K234E: Y (Luminance) Signal 1.0Vp-p
S/N Ratio	50 dB or more	46 dB or more
Horizontal Resolution	470 TV Line or more	VK-S234: 470 TV Line or more VK-S234E: 460 TV Line or more VK-K234/K234E: 500 TV Line or more
Minimum Required Illumination (Standard)	VK-S274/S274E: 1.0 lx VK-K274/K274E: 0.1 lx	VK-S234/S234E: 3.0 lx VK-K234/K234E: 0.1 lx
IR cf Mode	Not Provided	

2.2 Comparison of ICs

ITEM	VK-S274/VK-S274E VK-K274/VK-K274E	VK-S234/VK-S234E VK-K234/VK-K234E
CCD Sensor	VK-S274: ICX278AK-L (IC1001) VK-S274E: ICX279AK-L (IC1001) VK-K274: ICX278AL-7 (IC1001) VK-K274E: ICX279AL-7 (IC1001)	VK-S234: ICX208AK-6 (IC1001) VK-S234E: ICX209AK-6 (IC1001) VK-K234: ICX208AL-6 (IC1001) VK-K234E: ICX209AL-6 (IC1001)
Sensor Drive (or Drive Pulse Gen.)	µPD16510GR (IC1002)	
CDS AGC & A/D CONV.	HD49323AF (IC1101)	
Camera Digital Signal Processor (DSP)	HG73C053FE (IC1121)	
DRAM	MSM51V18165F (IC1122)	
Inv.	TC7SU04FU (IC1173)	TC7SHU04F (IC1173)
Clock Generator (or Inv.)	TC7SHU04FUL (IC1174)	TC7SU04F (IC1174)
Camera (or Digital) µP	HD64F2238AFA13-S274 (IC1201)	HD6432237M (IC1201)
EEPROM	X25097V1-2.7 (IC1202)	
Reset Pulse Gen.	RN5VD27AA (IC1203) TC7SH14FU (IC1204/IC1205) TC7S08FU (IC1206)	RN5VT28AA (IC1203) TC7SH14FU (IC1204/IC1205)
Zoom Motor Drive	MPC17AT85VM (IC1301)	
Focus Motor Drive	MPC17AT85VM (IC1302)	
F.Det./Iris Drive	µPD5023GS-147-GJG (IC1351)	
PWM	TL1464IPT (IC1501)	
Y/C Mix. & Video Amp	BA7664FV (IC1601)	
Level Shift	HD74HCT125T (IC1602)	
VCO/Phase Compa.	74VHC4046MTCX (IC1603)	
FV Pulse Gen.	IDC-7S08 (IC1604)	

1. Procedure

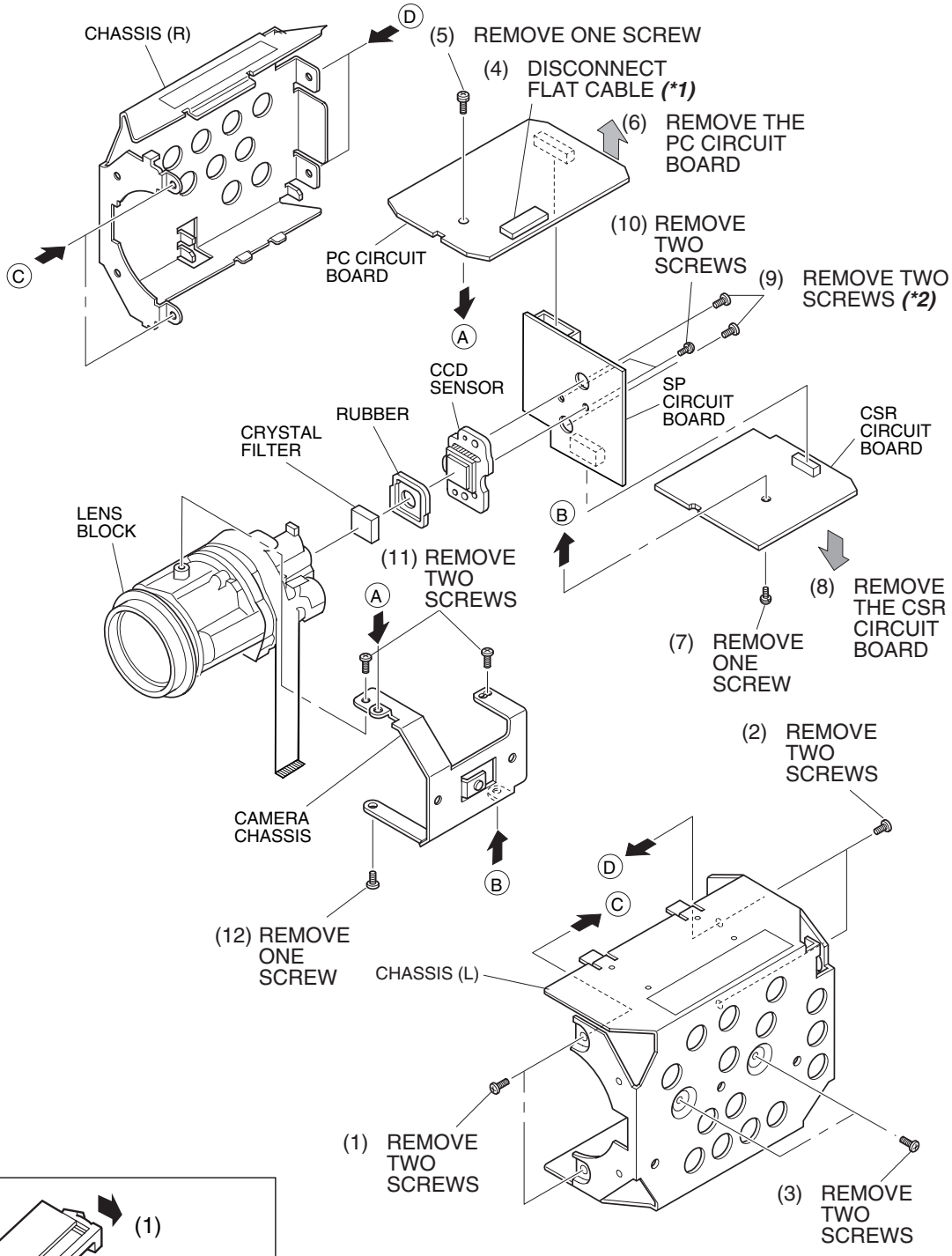
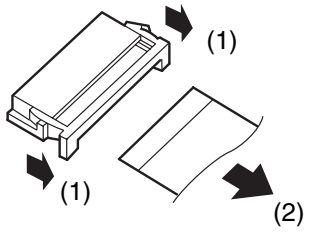


Fig. 2-1-1



(1) Release the lock of the connector on the left and right.
(2) Pull out the flat cable

Fig. 2-1-2

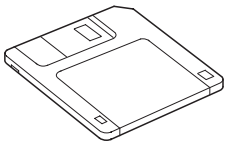
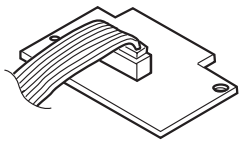
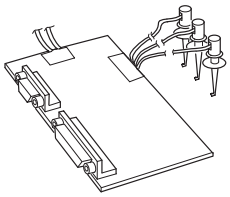
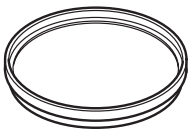
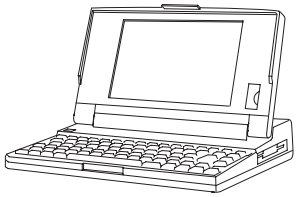
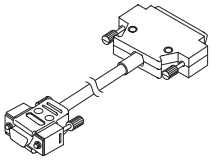
1: Do not the pull out the flat cable or touch the exposed terminal at the connecting position with your bare hands as it could cause a defective (1) and (2) shown in Fig. 2-1-2.

2: When the SP circuit board is removed, the crystal filter and rubber are also removed.
Be careful not to damege and lose them.

CHAPTER 3 ELECTRIC CIRCUIT ADJUSTMENT

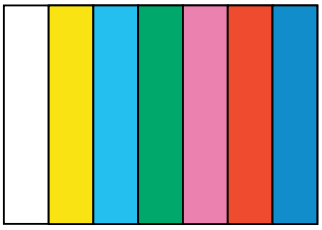
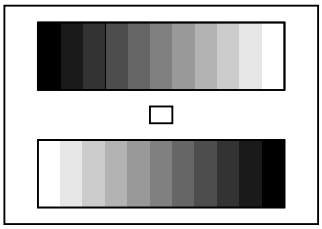
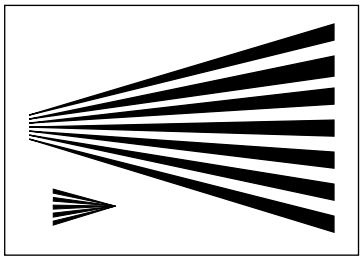
1. Test Equipment/Jigs Necessary for Adjustment

1.1 List of Equipment and Jigs

New **Adjutsment Floppy Disk (*1)** 	**DSP Interface Connect Jig** No. 7069179 	**DSP-R Jig** No.7099448 	**C12 Light Balancing Filter** No.7099369 
Personal Computer (PC) *[Goods on the Market]* 	**Personal Computer Cable** RS-232C (9 or 25 pins) Straight Type *[Goods on the Market]* 		

1: The adjustment floppy disk is not for sale: It will be supplied only when service maintenance contract is concluded.

1.2 List of Charts for Adjustment

Color Bar Chart 	**Gray Scale Chart** 	**Backfocus Chart** 

1.3 Test Equipment, etc.

Color video monitor (color TV for monitoring)
Oscilloscope
Vectorscope [If not available, adjustment is still possible, but easier if this is used]
Digital voltmeter (DVM)
3100 K light box
DC power supply (9 V/3 A) [To power of video camera]
DC power supply (5 V/1 A) [To power of DSP-R jig]

2. Before Starting Adjustment

2.1 Connections for Adjustment

Connect the video camera to the test equipment and jigs as shown in Fig. 2-1.

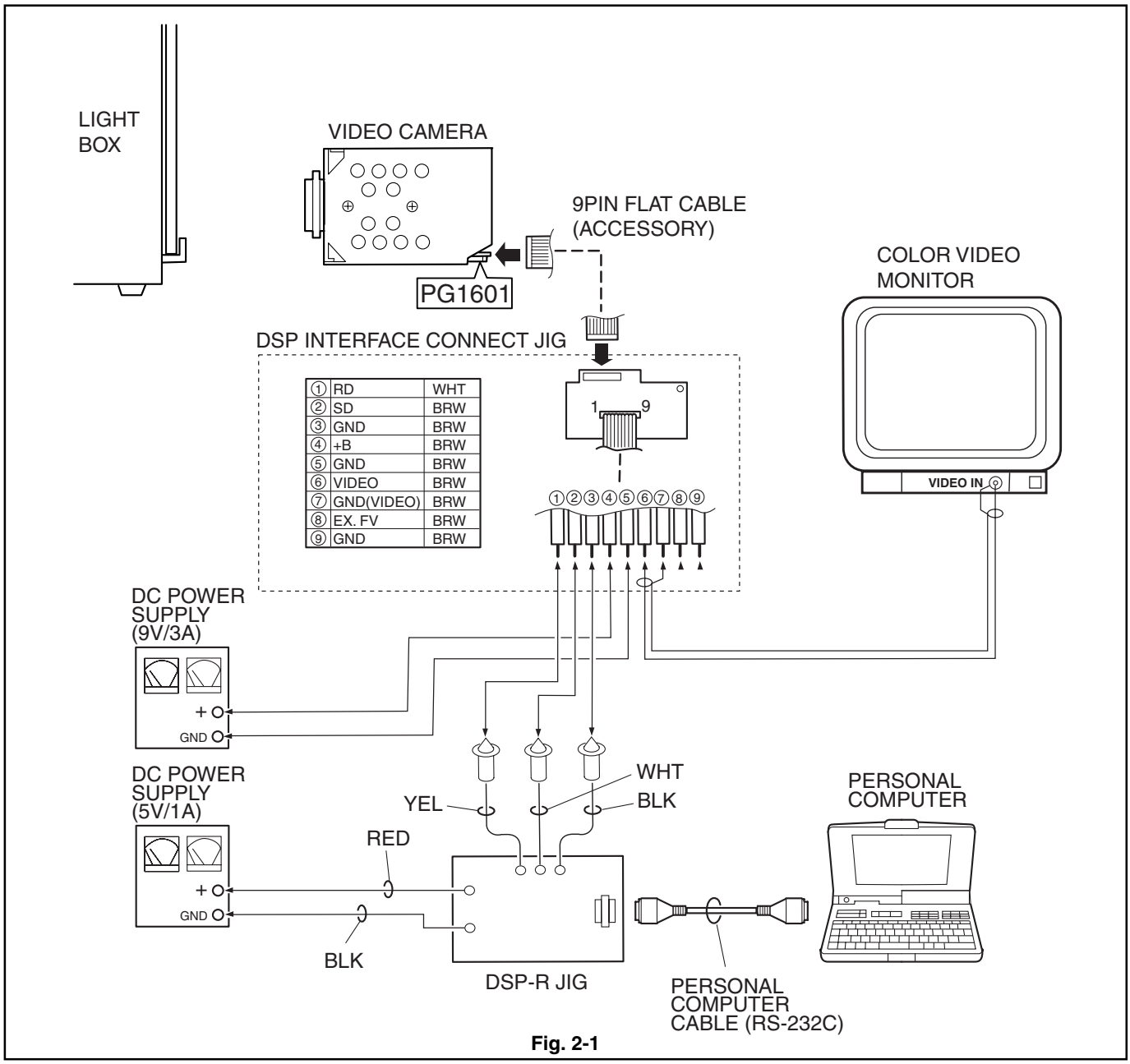


Fig. 2-1

2.2 Notes

1) All adjustments are performed using the adjustment program and personal computer (PC). The adjustment program is subject to change without notice for improvements in functions and operability, and the actual instructions on PC screen may be different from those in this manual: If so, follow the instructions on PC screen to proceed with adjustment.
2) Since this chapter uses the device with the highest performance among the models listed to explain adjustment, the actual instructions on PC screen may be different from those in this manual, depending on whether some functions are provided or not: If so, follow the instructions on PC screen to proceed with adjustment.
3) The adjustment program will not operate normally unless the video camera, PC and test equipment/jigs are all turned on.

4) Be sure to connect the video output of video camera to a color video monitor (terminate the video output with 75 ohm: If the video output is not connected to the monitor (and if it is not terminated with 75 ohm), the output video signal level cannot be measured correctly.
5) Use light box that does not flicker and whose color temperature is controlled, for adjustment. If an inappropriate light box is used, precise adjustment will not be possible, and the adjustment program will not operate normally.
6) Take care with the following when pointing the video camera at a chart (light box):
   - Focus the chart correctly.
   - Set the chart (light box) 30-50 cm away from the lens surface, and avoid any effects from surrounding light (except for a case where some designation is given).
   - Aim at the chart and let chart fill the screen (video period). (Except for a case where some designation is given.)

2.3 Setting Test Equipment

1) Set the switches, knobs and each mode of oscilloscope as follows for adjustment:

Probe:	10:1
TIME/DIV:	10 or 20 μs (except for a case where some designation is given)
VOLTS/DIV:	Will vary depending on the measurement object (except for a case where some designation is given)
Synchronization:	Internal sync (except for a case where some designation is given)
AC/DC/GND:	AC (except for a case where some designation is given)

Note: The names of switches, knobs, modes, etc. of oscilloscope may vary slightly depending on the manufacturer or model. Since some oscilloscopes may have switches, etc. other than the above that must be set, see the instruction manual of the particular oscilloscope for details.

3. List of Adjustment Items

The following table shows the adjustment items, their purposes, and whether or not check is required after replacing major components.
The components shown in the table below are the minimum to be checked after replacing major components: If several components have been replaced - or depending on the cause of a defect - more components may need to be checked.

● : **CHECK**

Items	Purpose Adjustment	Circuit Boards		Electrical Parts					Other
		SP	PC (*1)	IC1001	IC1101	IC1201	IC1250 (*1)	IC1351	Lens Block
Data Initialize									
Data Initilize **(*2)**	Initilizing EEPROM.		●				●		
Electric Volume									
CDS Sampling Pulse	To suppress noise in the CCD sensor output signal and maximize the signal level.		●		●		●		
Camera Adjustment (Adjustment)									
Auto Iris	To set the iris control data.	●	●	●		●	●	●	●
Matrix **(*3)**	To compensate for uneveness in the chroma signal	●	●	●			●		
White Balance **(*3)**	To input the automatic white balance control data.	●	●	●			●		
Chroma Gain **(*3)**	To set the color satuation under the reference color temperrature.	●	●	●			●		
Auto Focus									
Zoom/Focus Tracking	To set the out-of -focus correction level during zooming.	●	●	●			●		●
AF Noise Level	To set the noise level in the autofocus circuit.	●	●	●			●		●
Check of Zoom Trace	To check the autofocus adjustment.	●	●	●			●		●
Spot Noise									
Spot Noise	To correct spot noise.	●	●	●			●		

***1**: When replacing the PC circuit board (containing EEPROM) or EEPROM, be sure to perform all adjustments only after "Data Initialize".
***2**: Since all adjustments must be performed any time "Data Initialize" is done, do not perform it indiscriminately.
***3**: For the color video camera (TYPE S/SE).

4. Starting Adjustment Program (SMAP)

Note: If error message appears during adjustment, refer to "10. Error Messages".

1) Connect the video camera, DSP-R jig and PC as shown in Fig. 2-1, and supply power to them. (*1)
2) Operate the PC to start MS-DOS®. (*2)
3) Make sure that the adjustment floppy disk is write-protected.
4) Insert the adjustment floppy disk into the floppy disk drive of PC.
5) Use the PC keyboard to type **A:** and press **Enter** key. (*3) (See the MS-DOS screen-1 and 2)
6) Type **SMAP_IBM**®(space) **1** and press **Enter** key. (*4) (See the SMAP input screen)
7) The SMAP will start: Make sure that the model select screen appears on the PC display. (*5) (See the model select screen)
8) If the appropriate model is displayed on the model select screen, input the number to PC. If the appropriate model name is not shown on the model select screen, input **P** to PC until the model name appears. (*6)
9) The screen for verifying the model name will appear on PC display: If it is correct, input **Y** to PC. If it is incorrect, input **N** and start over (from step 8).
10) Make sure that the main menu appears on PC display: If it does not appear, check whether model selection (in step 8) is correct.

*1: If the connection of jig, etc. is inappropriate or power is not supplied, the adjustment program will not start normally.

*2: For details on how to start MS-DOS, refer to the instruction manual of PC, since this varies for each PC.

*3: The letter to be input is to designate the drive into which the adjustment floppy disk has been inserted. If using a drive other than A, designate the drive.

*4: The number to be input after a space is to designate the serial port no. of PC. If the PC has two or more serial ports, and the DSP-R jig is connected to a port other than serial port 1, input the serial port number.

*5: If the model select screen does not appear, make sure of the following:
- Power is supplied to the video camera and DSP-R jig.
- The designation of drive (in step 5) is correct.
- The designation of serial port is correct.
- The correct adjustment floppy disk has been correctly inserted.

*6: If an erroneous model name or number is selected, misoperation message will appear on PC display: Press any key to restore the model select screen.

To terminate the adjustment program (SMAP):

Press the **Esc** key once to three times until the PC display returns from each menu screen to the MS-DOS screen.
When the MS-DOS screen appears on PC display, turn off the video camera and jig.

MS-DOS screen-1

```
C>
```

⬇

MS-DOS screen-2

```
C>A:
A>
```

⬇

Type **SMAP_IBM 1**.

⬇

SMAP input screen

```
C>A:
A>SMAP_IBM 1
```

⬇

Press **Enter** key.

⬇

Model select screen

```
**********************************************************
                    MODEL SELECT
**********************************************************

                [1]     xxxxxxxx
                [2]     xxxxxxxx
                [3]     xxxxxxxx
                [4]     xxxxxxxx
                [5]     xxxxxxxx
                [P]     NEXT SELECTION
                [ESC] END

          Please select the type of the set
          Press [1] - [5] or [P] or [ESC]
```

⬇

Model select (Input the number).

⬇

Screen for verifying model name

```
          Selected model is xxxxxxxx
          Are you sure ?  (Y/N)
```

⬇

Input **Y**.

⬇

Main menu

```
**********************************************************
                MANUAL ADJUSTMENT PROGRAM
**********************************************************

                [A]     DATA INITIALIZE
                [B]     ELECTRIC VOLUME
                [C]     ADJUSTMENT
                [D]     AUTO FOCUS
                [E]     SPOT NOISE
                [ESC] END

          Please select [A] - [F] or [ESC]
```

Referrence

Misoperation message

```
          CAN NOT FIND THE DATA FILE
          **** PRESS ANY KEY ****
```

5. Data Initialize Procedure

The following explains the adjustment procedure using the adjustment program (SMAP), following the order of items on PC display.
Refer to "4. Starting Adjustment Program (SMAP)" in advance, start SMAP and display the main menu on PC display.
In actual work, it is possible to adjust one item independently.

Note: If error message appears on PC display during adjustment, perform troubleshooting, referring to "10. Error Messages".

5.1 Data Initialize

This procedure initializes the data in EEPROM (including the adjustment data).
Any time you replace the PC circuit board (containing EEPROM) or EEPROM, be sure to perform this procedure. [Generally, this procedure is not necessary after replacing other circuit board (components).]

Important:

- After completing this adjustment, be sure to perform all adjustment items as follows.

Procedure:

1) Input **A** to PC on the main menu screen.
2) The screen for verifying the initialization will appear: Input **Y** to PC. (*1)
3) Follow the instructions on PC display thereafter.

*1: Entering **N** on the screen for verifying initialization will restore the data main menu screen.

Main menu

```
**********************************************************
              MANUAL ADJUSTMENT PROGRAM
**********************************************************

          [A]    DATA INITIALIZE
          [B]    ELECTRIC VOLUME
          [C]    ADJUSTMENT
          [D]    AUTO FOCUS
          [E]    SPOT NOISE
          [ESC]  END

          Please select [A] - [F] or [ESC]
```

⬇

Input **A**.

⬇

Screen for verifying initialization

```
<< DATA WRITING >>
START TO SEND DATA.  (Y/N)
```

⬇

Input **Y**.

⬇

Follow the instructions on PC display thereafter.

6. Electronic Volume Adjustment Procedure

The following explains the adjustment procedure using the adjustment program (SMAP), following the order of items on PC display.
Refer to "4. Starting Adjustment Program (SMAP)" in advance, start SMAP and display the main menu on PC display.
In actual work, it is possible to adjust one item independently.

Note: If error message appears on PC display during adjustment, perform troubleshooting, referring to "10. Error Messages".

Before starting:

1) Input **B** to PC on the main menu screen to display the electronic volume menu screen. (*1)

   *1: Pressing the **Esc** key on the adjustment menu screen will restore the main menu screen.

Main menu

```
**********************************************************
          MANUAL ADJUSTMENT PROGRAM
**********************************************************
          [A]    DATA INITIALIZE
          [B]    ELECTRIC VOLUME
          [C]    ADJUSTMENT
          [D]    AUTO FOCUS
          [E]    SPOT NOISE
          [ESC]  END

          Please select [A] - [F] or [ESC]
```

⬇

Input **B**.

⬇

Electronic volume menu

```
**********************************************************
          ELECTRIC VOLUME
**********************************************************
          [1]    CDS SAMPLING PULSE
          [ESC]  RETURN TO MAIN MENU
          Please select [1] or [ESC]
```

6.1 CDS Sampling Pulse Adjustment

Incompleted Phenomenon:

Diagonal beats and horizontal noise occur.

Condition:

Leave the video camera for more than 2 minutes until the circuits are stabilized after turing it on, then start adjustment.

Procedure:

1) Input **1** to PC on the adjustment menu screen.
2) Follow the instruction on PC display thereafter.

Electronic volume menu

```
**********************************************************
          ELECTRIC VOLUME
**********************************************************
          [1]    CDS SAMPLING PULSE
          [ESC]  RETURN TO MAIN MENU
          Please select [1] or [ESC]
```

⬇

Input **1**.

⬇

Follow the instructions on PC display thereafter.

7. Camera Adjustment (Adjustment) Procedure

The following explains the adjustment procedure using the adjustment program (SMAP), following the order of items on PC display.
Refer to "4. Starting Adjustment Program (SMAP)" in advance, start SMAP and display the main menu on PC display.
In actual work, it is possible to adjust one item independently.

Note: If error message appears on PC display during adjustment, perform troubleshooting, referring to "10. Error Messages".

Before starting:

1) Input **C** to PC on the main menu screen to display the adjustment menu screen.
2) Input to PC the appropriate adjustment number. (*1)

   *1: Pressing the **Esc** key on the adjustment menu screen will restore the main menu screen.

Main menu

```
**********************************************************
          MANUAL ADJUSTMENT PROGRAM
**********************************************************

          [A]    DATA INITIALIZE
          [B]    ELECTRIC VOLUME
          [C]    ADJUSTMENT
          [D]    AUTO FOCUS
          [E]    SPOT NOISE
          [ESC]  END

          Please select [A] - [F] or [ESC]
```

⬇

Input **C**.

⬇

Adjustment menu

```
**********************************************************
                  ADJUSTMENT
**********************************************************

          [1]    AUTO IRIS CONTROL
          [2]    MATRIX
          [3]    WHITE BALANCE
          [4]    CHROMA GAIN
          [ESC]  RETURN TO MAIN MENU

          Please select [1] - [3] or [ESC]
```

7.1 Auto Iris Control Adjustment

Incompleted Phenomenon:

The picture becomes too bright.
The picture becomes too dark.

Condition:

Set the zoom to wide end and point at the light box, without chart inserted, to fill the screen.

Procedure:

1) Input **1** to PC on the adjustment menu screen.
2) Follow the instruction on PC display thereafter.
3) After the AIC (auto iris control) adjustment complete screen appears, press any key to restore the adjustment menu screen.
4) Turn the video camera off, leave as is for at least 5 seconds, and then turn it on again. (*1)

   *1: When the video camera is turned on again, the SMAP may not operate normally, and the following adjustments may not be possible. If this happens, press the **Esc** key to restore the MS-DOS screen, and then restart the SMAP.

Adjustment menu

```
**********************************************************
                  ADJUSTMENT
**********************************************************

          [1]    AUTO IRIS CONTROL
          [2]    MATRIX
          [3]    WHITE BALANCE
          [4]    CHROMA GAIN
          [ESC]  RETURN TO MAIN MENU

          Please select [1] - [3] or [ESC]
```

⬇

Input **1**.

⬇

Follow the instructions on PC display thereafter.

⬇

AIC adjustment complete

```
          ADJUSTMENT FINISHED
          PRESS ANY KEY
```

⬇

Press any key.

⬇

Turn the video camera off.

7.2 Matrix Adjustment [For TYPE S/SE] (Fig. 7-1)

Incompleted Phenomenon:

Color reproduction becomes defective.

Test Point:

Video Out (PG1601-6)

Equipment/Jig:

Oscilloscope

Conditions:

Point at a color bar chart.

Adjustment menu

```
**********************************************************
                  ADJUSTMENT
**********************************************************

          [1]    AUTO IRIS CONTROL
          [2]    MATRIX
          [3]    WHITE BALANCE
          [4]    CHROMA GAIN
          [ESC]  RETURN TO MAIN MENU

          Please select [1] - [3] or [ESC]
```

⬇

Input **2**.

⬇

Procedure:

1) Input **2** to PC on the adjustment menu screen.
2) The matrix adjustment screen will appear.
3) Press the **D** key to minimize the yellow (YEL) level.
   Press the **U** key so the ratio between yellow (YEL) and blue (BLU) levels is 1:4.
   Press the **Ctrl** key and hold it down, then press the **U** and **D** keys so the ratio between yellow (YEL) and blue (BLU) levels is 1:4.
4) Press the **Enter** key: The PC display will switch from the matrix data write screen to matrix adjustment complete screen.
5) Press any key to restore the adjustment menu screen.

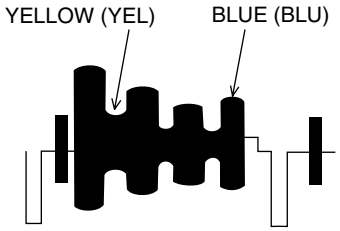


Fig. 7-1

Matrix adjustment

```
<< ADJUSTMENT OF BLUE MATRIX >>
        ROUGH ADJUSTMENT
[U]             UP
[D]             DOWN

        FINE ADJUSTMENT
[Crt] + [U]     UP
[Crt] + [D]     DOWN

[ENTER]         SAVE & RETURN TO MENU
[ESC]           QUIT
```

Set the ratio between yellow (YEL) and blue (BLU) levels is 1:4.

Press **Enter** key.

Matrix data write

```
<< ADJUSTMENT OF BLUE MATRIX >>
DATA WRITING INTO EEPROM
```

Matrix adjustment complete

```
<< ADJUSTMENT OF BLUE MATRIX >>
ADJUSTMENT FINISHED
PRESS ANY KEY
```

Press any key.

7.3 White Balance Adjustment [For TYPE S/SE]

Incompleted Phenomenon:

Color of the subject is different from that of the picture.
A white subject is not seen as white.

Equipment/Jig:

C12 light balance filter

Conditions:

Attach a C12 light balance filter to lens.
Set the zoom to wide end, and point at a gray scale chart.

Procedure:

1) Input **3** to PC on the adjustment menu screen.
2) Follow the instructions on PC display thereafter.
3) After the white balance adjustment complete screen appears, press any key to restore the adjustment menu screen.

Adjustment menu

```
**********************************************************
                    ADJUSTMENT
**********************************************************
        [1]     AUTO IRIS CONTROL
        [2]     MATRIX
        [3]     WHITE BALANCE
        [4]     CHROMA GAIN
        [ESC]   RETURN TO MAIN MENU

        Please select [1] - [3] or [ESC]
```

Input **3**.

Follow the instructions on PC display thereafter.

White balance adjustment complete

```
<< ADJUSTMENT OF WHITE BALANCE >>
ADJUSTMENT FINISHED
PRESS ANY KEY
```

Press any key.

7.4 Chroma Gain Adjustment [For TYPE S/SE] (Figs. 7-2, 7-3, 7-4)

Incompleted Phenomenon:

Color of the picture is denser than that of the subject.

Color of the picture is lighter than that of the subject.

Test Point:

Video Out (PG1601-6)

Equipment/Jig:

Oscilloscope or Vectorscope

C12 light balance filter

Condition:

Attach a C12 light balance filter to lens

Point the at a color bar chart.

Procedure:

1) Input **4** to PC on the adjustment menu screen.
2) The chroma gain adjustment screen will appear.
3) *When using an oscilloscope (Fig. 7-2):*

   Press the **D** or **U** key to set the red level on waveform to approx. 620 mVp-p.

   Then, while holding down the **Ctrl** key, press the **D** or **U** key to set the red level on waveform to approx. 620 mV ± 20 mVp-p.

   When using a vectorscope (Figs. 7-3, 7-4):

   Press the **D** or **U** key to set the red vector to approx. 220% of burst vector.

   Then, while holding down the **Ctrl** key, press the **D** or **U** key to set the red vector to approx. 220% ± 5% of burst vector.
4) Press the **Enter** key: The PC display will switch from the chroma gain data write screen to chroma gain adjustment complete screen.
5) Press any key to restore the adjustment menu screen.

Adjustment menu

```
**********************************************************
                      ADJUSTMENT
**********************************************************

          [1]    AUTO IRIS CONTROL
          [2]    MATRIX
          [3]    WHITE BALANCE
          [4]    CHROMA GAIN
          [ESC]  RETURN TO MAIN MENU

          Please select [1] - [3] or [ESC]
```

⬇

Input **4**.

⬇

Chroma gain adjustment

```
<< ADJUSTMENT OF CHROMA GAIN >>
          ROUGH ADJUSTMENT
 [U]          CHROMA GAIN UP
 [D]          CHROMA GAIN DOWN

          FINE ADJUSTMENT
 [Crt] + [U]  CHROMA GAIN UP
 [Crt] + [D]  CHROMA GAIN DOWN

 [ENTER]      SAVE & RETURN TO MENU
 [ESC]        QUIT
```

⬇

When using an oscilloscope

Set the red level on waveform to 620 mV ± 20 mVp-p.

When using a vectorscope

Set the red vector to 220 % ± 5 % of burst vector.

⬇

Press **Enter** key.

⬇

Chroma gain data write

```
<< ADJUSTMENT OF CHROMA GAIN >>
DATA WRITING INTO EEPROM
```

⬇

Chroma gain adjustment complete

```
<< ADJUSTMENT OF CHROMA GAIN >>
ADJUSTMENT FINISHED
PRESS ANY KEY
```

⬇

Press any key.

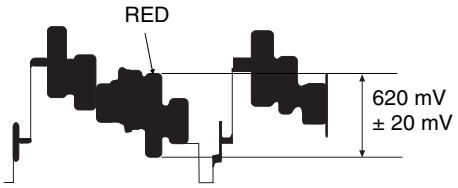


Fig. 7-2

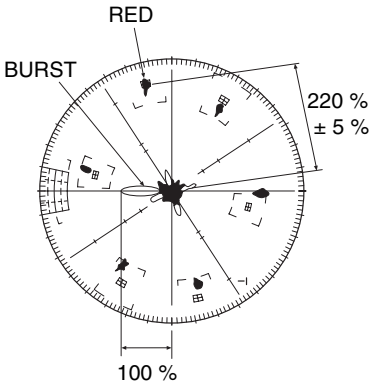


Fig. 7-3 [For TYPE S]

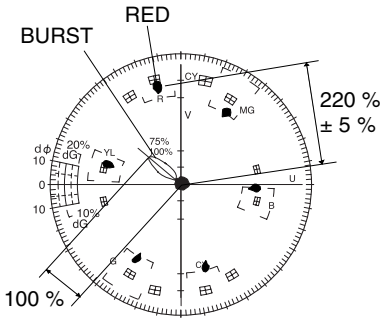


Fig. 7-4 [For TYPE SE]

8. Autofocus Adjustment Procedure

The following explains the adjustment procedure using the adjustment program (SMAP), following the order of items on PC display.
Refer to "4. Starting Adjustment Program (SMAP)" in advance, start SMAP and display the main menu on PC display.
In actual work, it is possible to adjust one item independently.

Note: If error message appears on PC display during adjustment, perform troubleshooting, referring to "10. Error Messages".

Before starting adjustment:

1) Input **D** to PC on the main menu screen to display the AF menu screen.
2) Input the appropriate adjustment number to PC. (*1)

   *1: Pressing the **Esc** key on the AF menu screen will restore the main menu screen.

Main menu

```
**********************************************************
          MANUAL ADJUSTMENT PROGRAM
**********************************************************

          [A]    DATA INITIALIZE
          [B]    ELECTRIC VOLUME
          [C]    ADJUSTMENT
          [D]    AUTO FOCUS
          [E]    SPOT NOISE
          [ESC]  END

          Please select [A] - [F] or [ESC]
```

⬇

Input **D**.

⬇

AF menu

```
**********************************************************
          AUTO FOCUS ADJUSTMENT
**********************************************************
[1]    ADJUSTMENT OF ZOOM/FOCUS TRACKING
[2]    ADJUSTMENT OF AF NOISE LEVEL
[3]    CHECK OF ZOOM TRACE
[ESC]  RETURN TO MENU
          Please select [1] - [3] or [ESC]
```

8.1 Zoom/Focus Tracking Adjustment

Incompleted Phenomenon:

Focus is lost during zooming.

Condition:

Point at the backfocus chart, 1500 ± 5mm away from the lens surface.
Light the backfocus chart with 200 - 400 lx.

Caution when Adjustment:

1) Measure the distance between the chart and lens surface precisely.
2) Place the chart as parallel as possible to the lens surface.
3) The backfocus chart should always be at the center of the monitor screen when the zoom is set to the wide-angle and telephoto ends.
4) The zoom trace adjustment procedure is completed within 2 minutes after it is selected.
5) Do not place any obstruction between the lens and chart during adjustment.

Procedure:

1) Input **1** to PC on the AF menu screen.
2) Follow the instructions on PC display thereafter.

AF menu

```
**********************************************************
          AUTO FOCUS ADJUSTMENT
**********************************************************
[1]    ADJUSTMENT OF ZOOM/FOCUS TRACKING
[2]    ADJUSTMENT OF AF NOISE LEVEL
[3]    CHECK OF ZOOM TRACE
[ESC]  RETURN TO MENU
          Please select [1] - [3] or [ESC]
```

⬇

Input **1**.

⬇

Follow the instructions on PC display thereafter.

8.2 AF Noise Level Adjustment

Incompleted Phenomenon:

It takes time until a subject is brought into focus.
Correct focus is not obtained.

Condition:

Point at a light box without a chart inserted at a distance of up to 10cm.

Caution when Adjustment:

1) Place the light box as parallel as possible to the lens surface.
2) The AF noise level adjustment procedure will be completed within thirty seconds after it is selected.

Procedure:

1) Input **2** to PC on the AF menu screen.
2) Follow the instructions on PC display thereafter.

AF menu

```
**********************************************************
              AUTO FOCUS ADJUSTMENT
**********************************************************
[1]     ADJUSTMENT OF ZOOM/FOCUS TRACKING
[2]     ADJUSTMENT OF AF NOISE LEVEL
[3]     CHECK OF ZOOM TRACE
[ESC]   RETURN TO MENU
              Please select [1] - [3] or [ESC]
```

⬇

Input **2**.

⬇

Follow the instructions on PC display thereafter.

8.3 Check of Zoom Trace

Incompleted Phenomenon:

Focus is lost during zooming.

Condition:

Point at the backfocus chart, 1500 ± 5mm away from the lens surface.
Light the backfocus chart with 200 - 400 lx.

Caution when Adjustment:

1) Measure the distance between the chart and lens surface precisely.
2) Place the chart as parallel as possible to the lens surface.
3) The backfocus chart should always be at the center of the monitor screen when the zoom is set to the wide-angle and telephoto ends.
4) Do not place any obstruction between the lens and chart during adjustment.

Procedure:

1) Input **3** to PC on the AF menu screen.
2) Follow the instructions on PC display thereafter.
   If error message appears, readjust the following items:
   8.1 Zoom/Focus Tracking Adjustment
   8.2 AF Noise Level Adjustment

AF menu

```
**********************************************************
              AUTO FOCUS ADJUSTMENT
**********************************************************
[1]     ADJUSTMENT OF ZOOM/FOCUS TRACKING
[2]     ADJUSTMENT OF AF NOISE LEVEL
[3]     CHECK OF ZOOM TRACE
[ESC]   RETURN TO MENU
              Please select [1] - [3] or [ESC]
```

⬇

Input **3**.

⬇

Follow the instructions on PC display thereafter.

9. Spot Noise Adjustment Procedure

The following explains the adjustment procedure using the adjustment program (SMAP), following the order of items on PC display.
Refer to "4. Starting Adjustment Program (SMAP)" in advance, start SMAP and display the main menu on PC display.
In actual work, it is possible to adjust one item independently.

Note: If error message appears on PC display during adjustment, perform troubleshooting, referring to "10. Error Messages".

Important:

- Spot noise refers to bright points that appear on the screen, which are caused by a defect in pixel of CCD image sensor.
- Perform this adjustment after specified components have been replaced (see "List of Adjustment Items").
- Perform this adjustment if spot noise occurs under abnormal usage conditions or after long-term use.
- If spot noise still occurs after this adjustment is complete, the CCD image sensor may be defective.
- Perform this adjustment after completing all other adjustments. (Perform this adjustment in normal video status.)

9.1 Spot Noise Adjustment

Incompleted Phenomenon:

Spot noise occurs under abnormal usage conditions or after long-term use.

Equipment:

Color video monitor (CRT type is desirable)

Condition:

Cap the lens (so that no light enters).

Procedure:

1) Input **E** to PC on the main menu screen.
2) Follow the instructions on PC display thereafter.
3) The screen for verifying writing of spot noise data will appear: Input **Y**. (*1)
4) When writing data is complete, the spot noise data write complete screen will appear: Press any key to restore the main menu screen.

*1: Entering **N** on the screen for verifying writing of spot noise data will restore the main menu screen.

Main menu

```
**********************************************************
          MANUAL ADJUSTMENT PROGRAM
**********************************************************

          [A]    DATA INITIALIZE
          [B]    ELECTRIC VOLUME
          [C]    ADJUSTMENT
          [D]    AUTO FOCUS
          [E]    SPOT NOISE
          [ESC]  END

          Please select [A] - [F] or [ESC]
```

⬇ Input **E**. ⬇

Follow the instructions on PC display thereafter.

⬇

Screen for verifying writing of spot noise data

```
<< DATA WRITING >>
START TO SEND DATA.  (Y/N)
```

⬇ Input **Y**. ⬇

Spot noise data write complete

```
FINISHED WRITING DATA
PRESS ANY KEY
```

10. Error Messages

A message may appear while you are adjusting the video camera. If a message appears, refer to the following table and take appropriate corrective action.

10.1 Error Message of Electric Volume and Camera Adjustment

ERROR MESSAGE	COUNTERMEASURE
ERROR OCCURRED. IRIS TROUBLE PRESS ANY KEY	• Check whether or not power is supplied. • Check the values of the iris drive circuit. • Defective soldering, damage to pattern, etc. in the above circuit. • Check the iris block and replace it if necessary.
ERROR OCCURRED ON da× ADJUSTMENT PRESS ANY KEY	• Check the values in the hall amp circuit. • Defective soldering, damage to pattern, etc. in the above circuit.
D RANGE OVER. ERROR ON da× ADJUSTMENT PRESS ANY KEY.	• Check the values in the hall amp circuit. • Defective soldering, damage to pattern, etc. in theabove circuit.
ERROR OCCURRED ON da0 and da1 ADJUSTMENT PRESS ANY KEY	• Check the values in the hall amp circuit and its peripheral circuits. • Defective soldering, damage to pattern, etc. in the above circuits.
FILE NOT FOUND !!!! PRESS ANY KEY	• The adjustment program (file) cannot be found. • Check the adjustment floppy disk and replace it if necessary.
FILE OPEN ERROR !!!! PRESS ANY KEY	• The adjustment program (file) does not start. • Check the adjustment floppy disk and replace it if necessary.
ERROR OCCURRED ON C DUTY ADJUSTMENT PRESS ANY KEY	• Check the values of the iris drive circuit. • Defective soldering, damage to pattern, etc. in the above circuit.
ERROR OCCURRED ON FDET ADJUSTMENT PRESS ANY KEY	• Supply power again and re-adjust. • Check the values in the hall amp circuit. • Defective soldering, damage to pattern, etc. in the above circuit.
ERROR OCCURRED. ZOOM DOES NOT WORK PRESS ANY KEY	• Supply power again and re-adjust.
TOO BRIGHT PRESS ANY KEY	• The subject is too bright. • Move the camera further away from the light box.
TOO DARK PRESS ANY KEY	• The subject is too dark. • Check the light box. • Move the camera closer to the light box.
D RANGE OVER ERROR ON HALL AMP IRIS CANNOT OPEN ANY MORE PRESS ANY KEY	• Supply power again and re-adjust. • The subject is too dark. • Check the light box. • Move the camera closer to the light box. • Check the values in the hall amp circuit. • Defective soldering, damage to pattern, etc. in the above circuit.
STAURATION ERROR. TOO BRIGHT PRESS ANY KEY	• The subject is too bright. • Move the camera further away from the light box.
CAN'T ADJUST WHITE BALANCE PLEASE RETRY PRESS ANY KEY	• The subject is too bright or too dark. • Check the light box. • Move the camera closer to or away from the light box. • Supply power again and re-adjust.

10.2 Error Message of Autofocus Adjustment

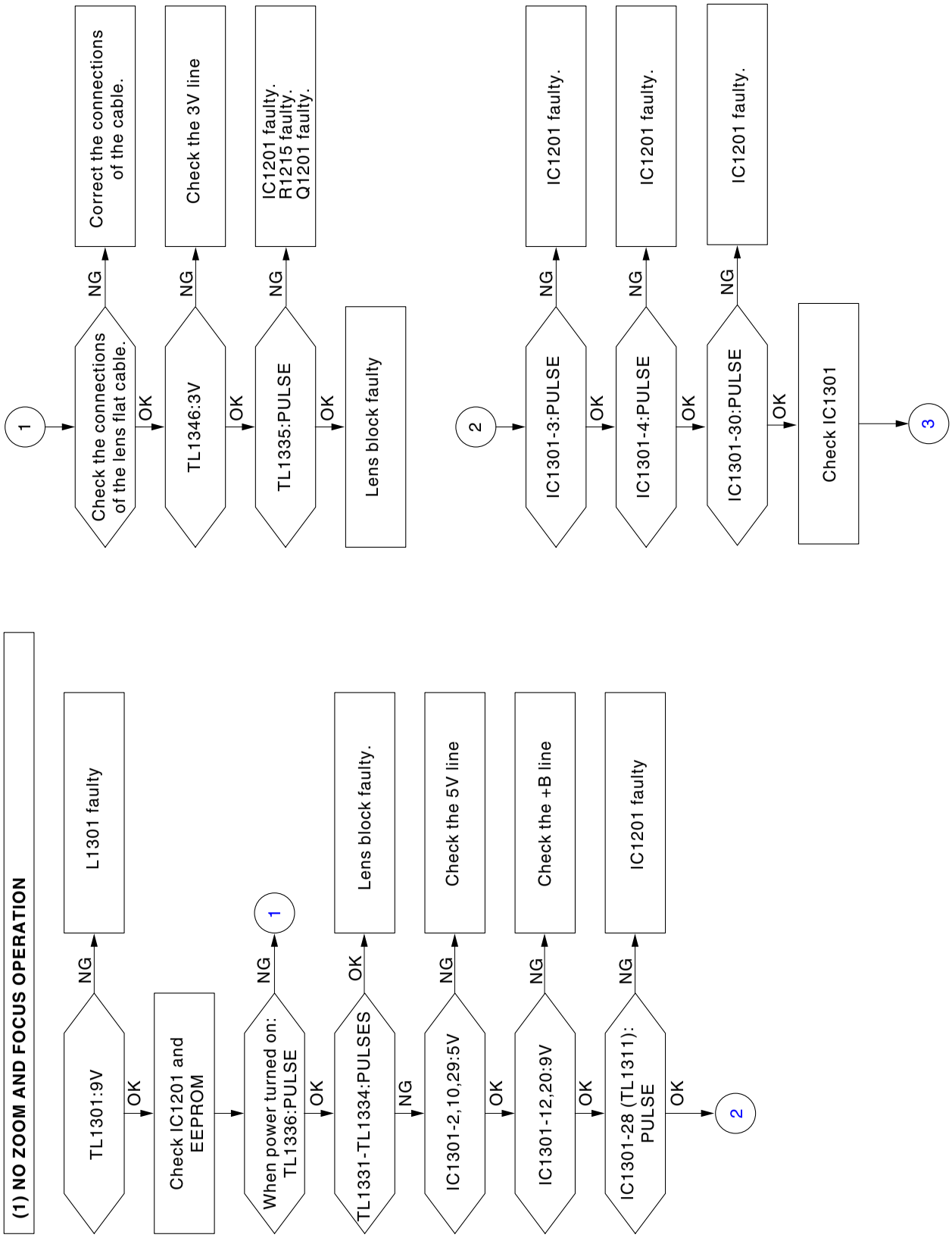
ERROR MESSAGE	COUNTERMEASURE
ERROR OCCURRED. ZOOM DOES NOT WORK PRESS ANY KEY	• Supply power again and re-adjust.
TIME OUT ERROR ON FOCUS	• Check the conditions of subject. • If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (1) of TROUBLESHOOTING OF AUTOFOCUS.
TIME OUT ERROR ON ZOOM	• If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (2) of TROUBLESHOOTING OF AUTOFOCUS.
TIME OUT ERROR ON AF STEP	• Check the conditions of subject. • If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (1) of TROUBLESHOOTING OF AUTOFOCUS.
AF LIMIT OVER	• Check the conditions of subject. • If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (2) of TROUBLESHOOTING OF AUTOFOCUS.
AF ERROR	• If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (1) of TROUBLESHOOTING OF AUTOFOCUS.
TOO DARK	• Insufficient lighting. Check the subject.

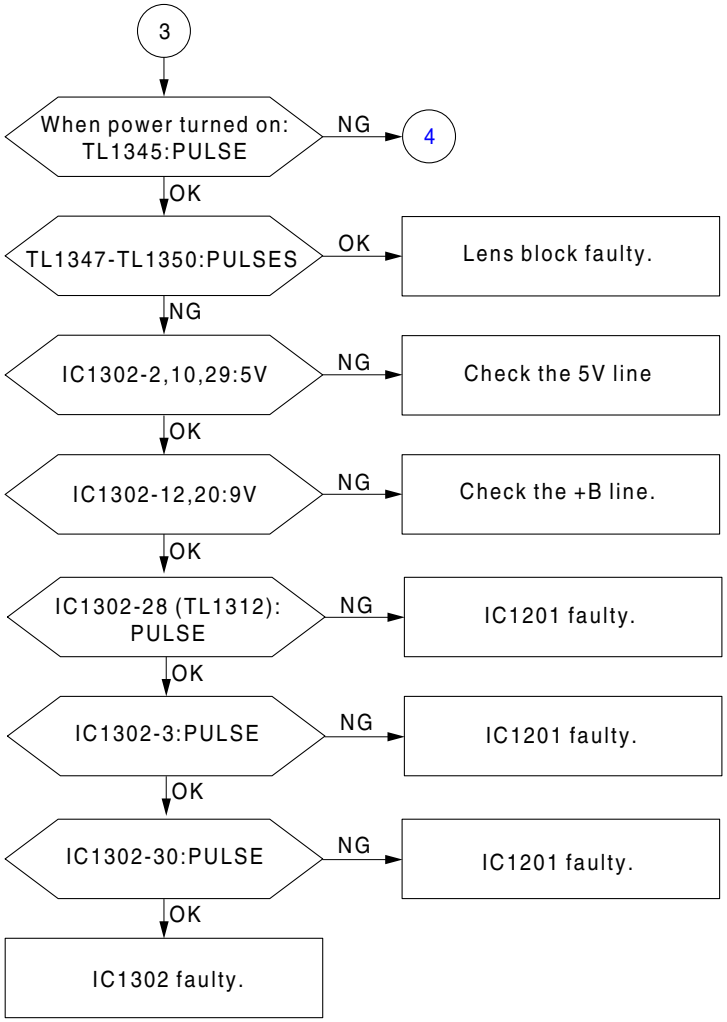
10.3 Error Message of Spot Noise Adjustment

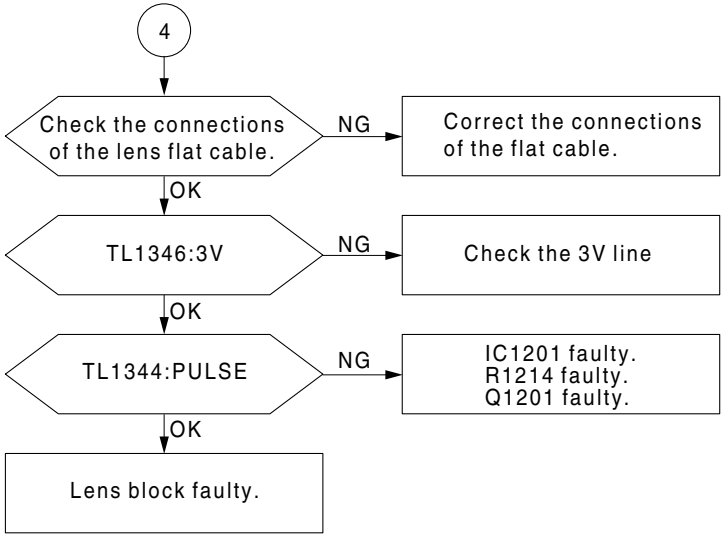
ERROR MESSAGE	COUNTERMEASURE
ERROR!! SPOT NOISE COMPENSATION IS STOPPED BY INITIAL DATA. PLEASE CHECK THE EEPROM. PRESS ANY KEY.	• Spot noise compensation is inhibited by the data in the EEPROM. • Turn the power on again. • Data in the EEPROM is defective. (Initialize it.) • Check the EEPROM, and if necessary, replace it.
ERROR!! THRESHOLD DATA ERROR. PLEASE CHECK THE EEPROM. PRESS ANY KEY.	• Turn the power on again. • Data in the EEPROM is defective. (Initialize it.) • Check the EEPROM, and if necessary, replace it.
ERROR!! THE SPOT NOISE IS TOO MANY. CAN'T COMPENSATE ANY MORE. PRESS ANY KEY.	• The amount of spot noise that can be compensated reaches the limit. • Turn the power on again. • Check the CCD image sensor, and if necessary, replace it.

10.4 Troubleshooting of Autofocus

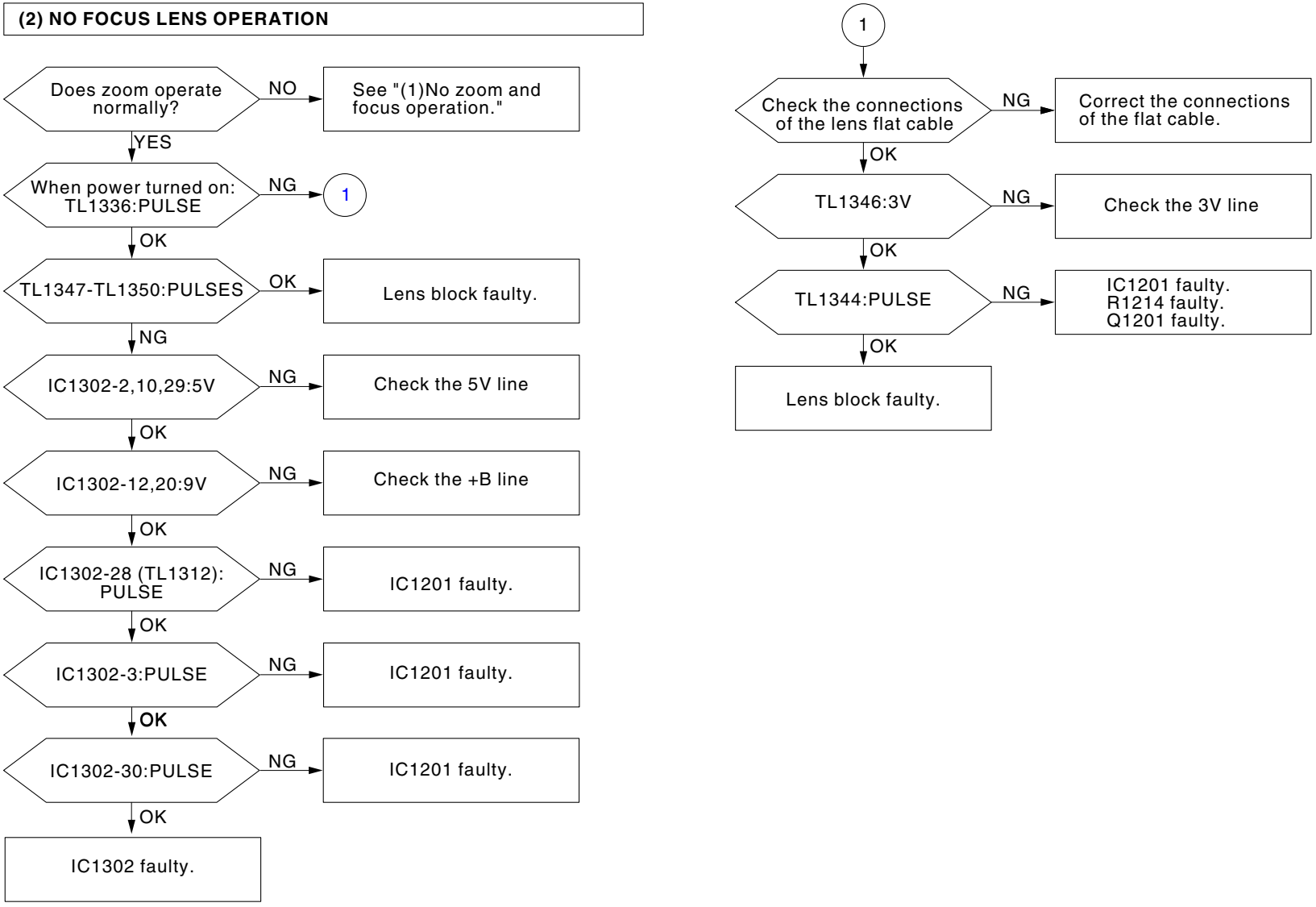
This troubleshooting corresponds to "10.2 Error Messages of Autofocus Adjustment". If an error message appears during autofocus adjustment, use this troubleshooting after referring to "10.2 Error Messages of Autofocus Adjustment".



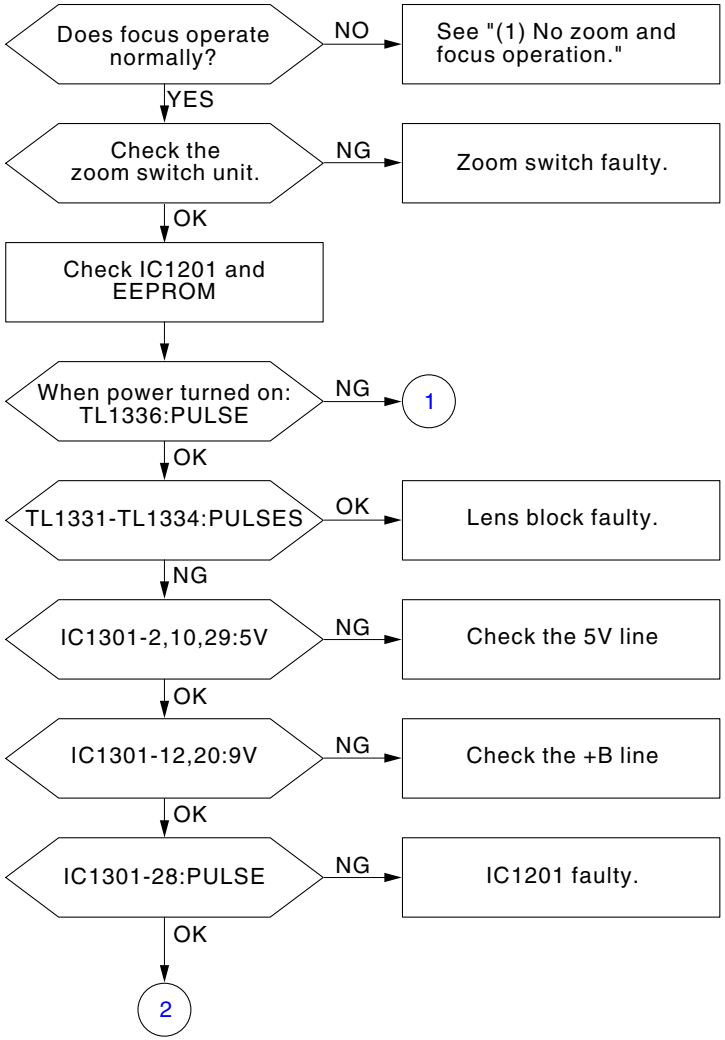

3
When power turned on: TL1345:PULSE
NG
4
OK
TL1347-TL1350:PULSES
OK
Lens block faulty.
NG
IC1302-2,10,29:5V
NG
Check the 5V line
OK
IC1302-12,20:9V
NG
Check the +B line.
OK
IC1302-28 (TL1312): PULSE
NG
IC1201 faulty.
OK
IC1302-3:PULSE
NG
IC1201 faulty.
OK
IC1302-30:PULSE
NG
IC1201 faulty.
OK
IC1302 faulty.

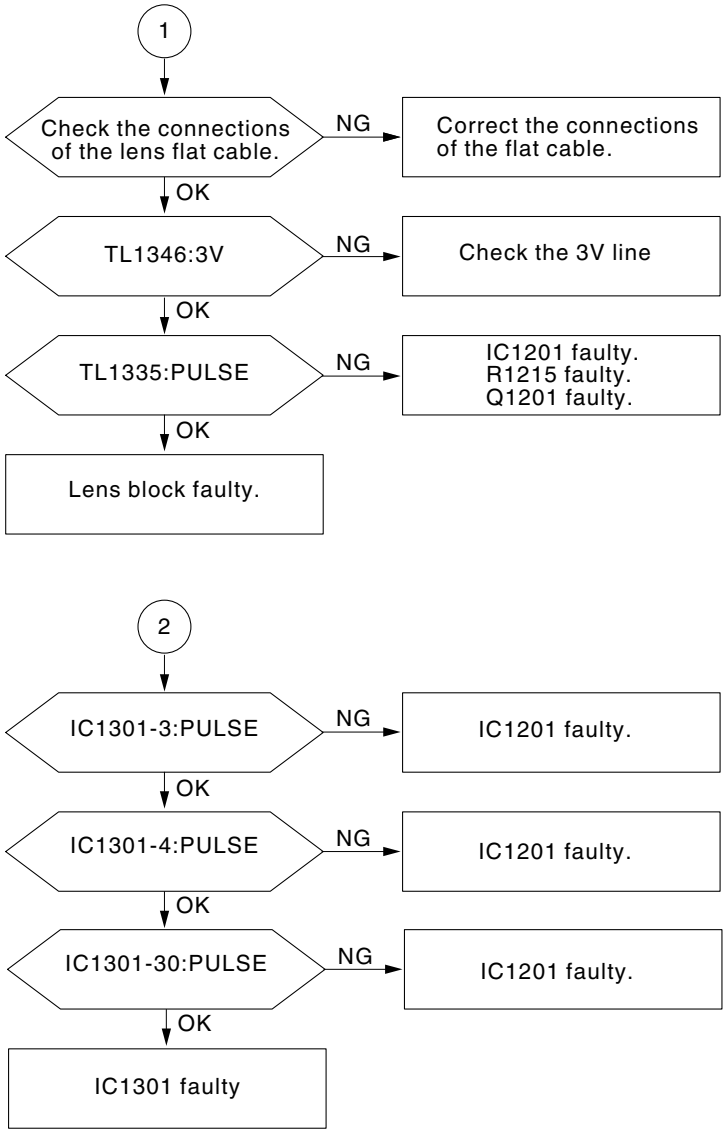

4
Check the connections of the lens flat cable.
NG
Correct the connections of the flat cable.
OK
TL1346:3V
NG
Check the 3V line
OK
TL1344:PULSE
NG
IC1201 faulty.
R1214 faulty.
Q1201 faulty.
OK
Lens block faulty.

(2) NO FOCUS LENS OPERATION

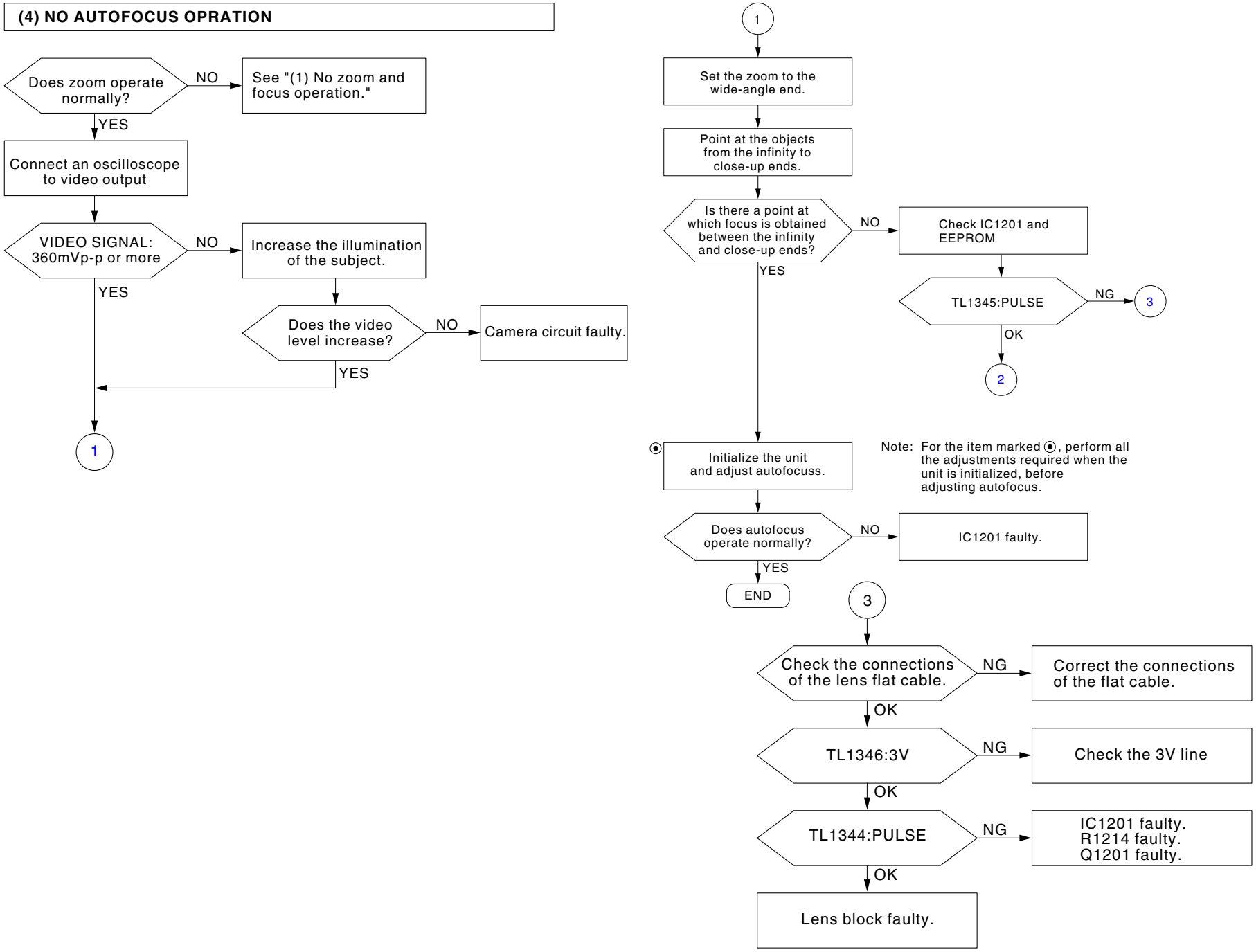


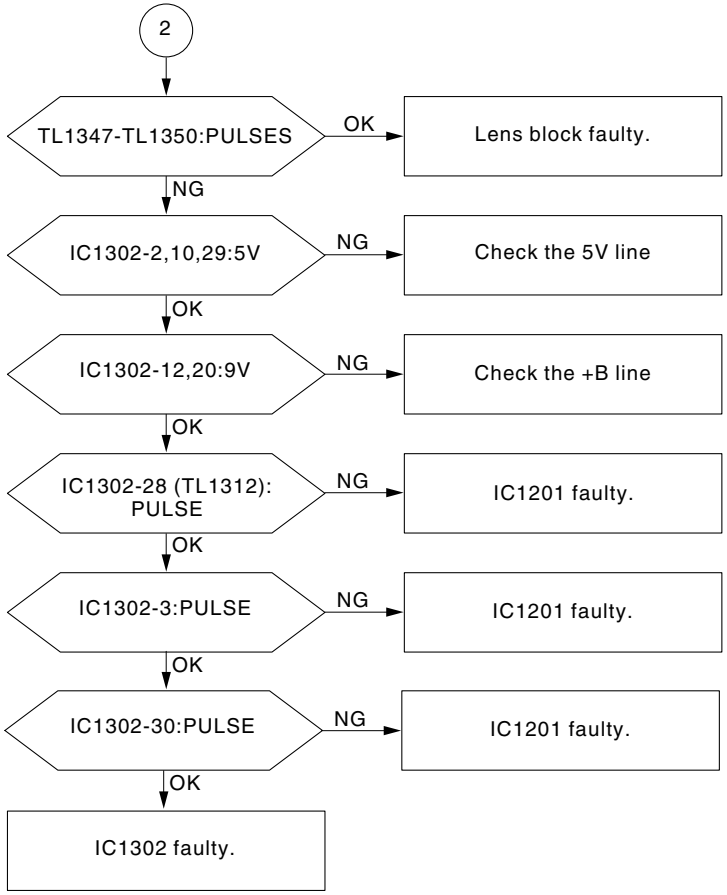
(3)NO ZOOM OPERATION



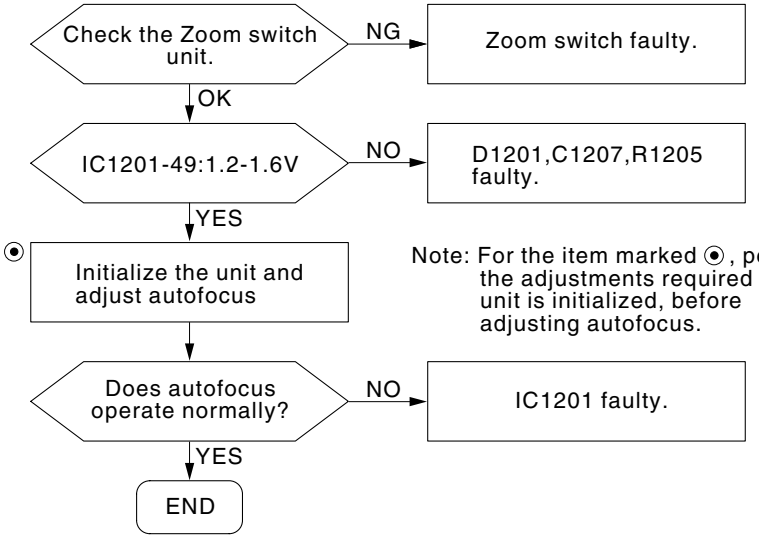


(4) NO AUTOFOCUS OPRATION





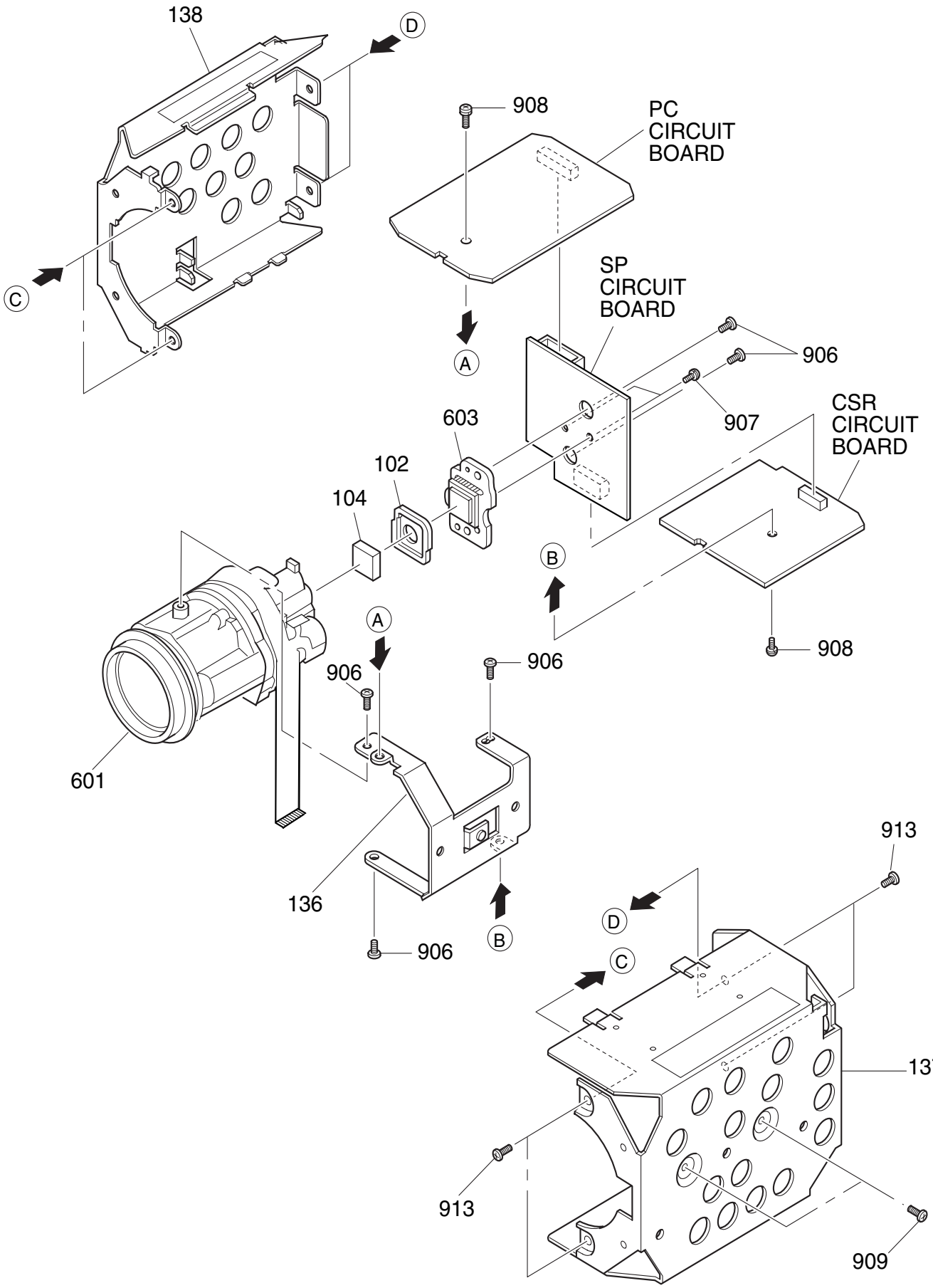
(5) SUBJECT IS GREATLY OUT-OF-FOCUS WHEN ZOOMED.



Note: For the item marked ⊙, perform all the adjustments required when the unit is initialized, before adjusting autofocus.

CHAPTER 4 EXPLODED VIEW

1. Exploded View



CHAPTER 5 REPLACEMENT PARTS LIST

1. MECHANICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION
		MECHANISM SECTION
102	NX11252	RUBBER
104	DT10251	CRYSTAL FILTER [TYPE S/SE]
104	DT10361	GLASS [TYPE K/KE]
136	NA19642	CHASSIS,CAMERA
137	NA31541	CHASSIS(L)
138	NA31551	CHASSIS(R)
601	KQ10752	LENS ASSY
603	UE15521	CCD IMAGE SENSOR [TYPE S]
603	UE15522	CCD IMAGE SENSOR [TYPE SE]
603	UE15523	CCD IMAGE SENSOR [TYPE K]
603	UE15524	CCD IMAGE SENSOR [TYPE KE]
906	7775945	SCREW(2X5)
907	8650103	SCREW(2X3)
908	8650105	SCREW (2X5)
909	8749103	2X3 BIND SCREW
913	7775963	SCREW(2X3)

2. ELECTRICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION
		CAPACITORS
C1001	0893107	CERAMIC CHIP 5PF+-0.25% 50V
C1003	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1004	0893211	CERAMIC CHIP 1500PF+-10% 50V
C1005	AA00422R	CERAMIC CHIP 10UF 16V
C1006	0893222	CERAMIC CHIP 0.01UF+-10% 50V
C1007	AA00393R	CHIP CERAMIC 1.0UF+80-20% 50V
C1008	AA00393R	CHIP CERAMIC 1.0UF+80-20% 50V
C1009	0893222	CERAMIC CHIP 0.01UF+-10% 50V
C1010	AA00393R	CHIP CERAMIC 1.0UF+80-20% 50V
C1011	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1012	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1018	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1101	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1102	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1103	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1104	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1105	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C1106	AA00441R	CHIP CAPACITOR 22UF+-20% 6.3V
C1107	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1108	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1109	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C1110	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1111	AA00951R	CERAMIC CAPACITOR 1.0UF+-10% 16V
C1112	AA00951R	CERAMIC CAPACITOR 1.0UF+-10% 16V
C1113	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1114	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C1115	AA00442R	CERAMIC CAPACITOR 10UF 6.3V
C1116	AA00441R	CHIP CAPACITOR 22UF+-20% 6.3V
C1121	AA00441R	CHIP CAPACITOR 22UF+-20% 6.3V
C1122	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1123	AA01111R	CERAMIC CHIP 1UF 6.3V
C1124	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1125	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1127	0893086	CERAMIC CHIP 0.1UF+80-20% 50V
C1128	0893107	CERAMIC CHIP 5PF+-5% 50V
C1129	0893107	CERAMIC CHIP 5PF+-5% 50V
C1130	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C1131	AA00951R	CERAMIC CAPACITOR 1.0UF+-10% 16V
C1132	0893119	CERAMIC CHIP 33PF+-5% 50V
C1133	AA00412R	CERAMIC CHIP 10UF+-80-20% 16V
C1134	AA00412R	CERAMIC CHIP 10UF+-80-20% 16V
C1135	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1136	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1137	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1138	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1139	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1140	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1141	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1142	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1143	AA00442R	CERAMIC CAPACITOR 10UF 6.3V
C1144	AA00441R	CERAMIC CAPACITOR 22UF 6.3V
C1145	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1160	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1162	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1176	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1177	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1178	0893123	CERAMIC CHIP 56PF+-5% 50V
C1180	0893123	CERAMIC CHIP 56PF+-5% 50V
C1182	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1183	0202322	CHIP CERAMIC 33PF+-2% 50V
C1184	0893125	CERAMIC CHIP 82PF+-5% 50V
C1185	0893104	CERAMIC CHIP 2.0PF 50V

SYMBOL NO	P-NO	DESCRIPTION
C1186	0202321	CHIP CERAMIC 27PF+-2% 50V
C1187	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1191	0893175	CERAMIC CHIP 1000PF+-5% 50V
C1192	0893175	CERAMIC CHIP 1000PF+-5% 50V
C1201	AA00442R	CERAMIC CAPACITOR 10UF 6.3V
C1202	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1203	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1204	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1205	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1206	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1207	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1208	AA00442R	CERAMIC CAPACITOR 10UF 6.3V
C1212	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1215	0893177	CAPACITOR 0.068UF+-10% 16V
C1216	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1217	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1218	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1250	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1251	AA01111R	CERAMIC CHIP 1UF+-10% 6.3V
C1252	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1300	AA00422R	CERAMIC CHIP 10UF 16V
C1301	0893222	CERAMIC CHIP 0.01UF+-10% 50V
C1302	0893215	CERAMIC CHIP 3300PF+-10% 50V
C1303	0893217	CERAMIC CHIP 4700PF+-10% 50V
C1304	0893217	CERAMIC CHIP 4700PF+-10% 50V
C1305	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1306	0893222	CERAMIC CHIP 0.01UF+-10% 50V
C1307	0893215	CERAMIC CHIP 3300PF+-10% 50V
C1308	0893217	CERAMIC CHIP 4700PF+-10% 50V
C1309	0893217	CERAMIC CHIP 4700PF+-10% 50V
C1310	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1311	AA00422R	CERAMIC CHIP 10UF 16V
C1312	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1313	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1317	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1318	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1319	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1320	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1351	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1352	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1353	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1354	0893132	CERAMIC CHIP 270PF+-5% 50V
C1355	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1356	0893007	CERAMIC CHIP 0.082UF+-10% 16V
C1357	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C1358	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C1359	0893133	CERAMIC CHIP 330PF+-5% 50V
C1360	0893133	CERAMIC CHIP 330PF+-5% 50V
C1361	0893133	CERAMIC CHIP 330PF+-5% 50V
C1362	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C1501	0206672	CHIP CAPACITOR 10UF+-20% 16V
C1502	0893165	CERAMIC CHIP 180PF+-5% 50V
C1503	0893202	CERAMIC CHIP 330PF+-10% 50V
C1504	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C1505	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C1506	AA00422R	CERAMIC CHIP 10UF 16V
C1507	0209942	CERAMIC CHIP 100PF+-5% 50V
C1508	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C1510	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C1512	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C1513	0893165	CERAMIC CHIP 180PF+-5% 50V
C1514	0893202	CERAMIC CHIP 330PF+-10% 50V
C1515	0893158	CERAMIC CHIP 56PF+-5% 50V
C1516	0893203	CERAMIC CHIP 390PF+-10% 50V
C1517	0893165	CERAMIC CHIP 180PF+-5% 50V

SYMBOL NO	P-NO	DESCRIPTION
C1518	0893202	CERAMIC CHIP 330PF+-10% 50V
C1519	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1520	0206671	ELECTROLYTIC 10UF 10V
C1521	AA00381R	CERAMIC CHIP 10UF +-10% 6.3V
C1522	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1523	0206671	ELECTROLYTIC 10UF 10V
C1524	AA00441R	CHIP CAPACITOR 22UF+-20% 6.3V
C1525	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1526	0206671	ELECTROLYTIC 10UF 10V
C1527	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1528	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1529	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1530	AA00393R	CHIP CERAMIC 1.0UF+80-20% 50V
C1531	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1532	AA00393R	CHIP CERAMIC 1.0UF+80-20% 50V
C1601	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1602	0206671	ELECTROLYTIC 10UF 10V
C1603	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1604	0806129	ELECTROLYTIC 22UF 10V
C1605	AD10273R	CHIP RESISTOR 100UF+-20% 6.3V
C1606	AD10252R	ELECTROLYTIC 1.0UF 20V
C1608	0893225	CERAMIC CHIP 0.1UF+80-20% 16V[TYPE K/KE]
C1610	0893179	CERAMIC CHIP 0.1UF+-10% 16V[TYPE S/SE]
C1611	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1612	0893179	CERAMIC CHIP 0.1UF+-10% 16V
C1613	0893011	CERAMIC CHIP 0.15UF+-10% 16V
C1614	AA00951R	CERAMIC CAPACITOR 1.0UF+-10% 16V
C1615	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C1616	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1617	0893114	CERAMIC CHIP 12PF+-5% 50V[TYPE SE]
C1617	0893117	CERAMIC CHIP 22PF+-5% 50V[TYPE S]
C1626	AA00381R	CERAMIC CHIP 10UF+-10% 6.3V
C1650	0893206	CERAMIC CHIP 680PF+-10% 50V
C1651	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
CP1151	5172801	FILTER,LOW PASS
CP1171	BE10501R	FILTER
CP1601	BV10211R	FILTER

RESISTORS

R1001	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1002	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R1004	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R1007	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1101	AQ00231R	CHIP RESISTOR 24KOHM+-1% 1/16W
R1121	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R1122	BM00132R	BLM11P600SPT
R1123	0790025	CHIP RESISTOR 120 OHM+-5% 1/16W
R1124	0790025	CHIP RESISTOR 120 OHM+-5% 1/16W
R1125	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R1126	AQ00215R	CHIP RESISTOR 6.2KOHM+-1% 1/10W
R1128	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R1155	AQ00198R	CHIP RESISTOR 1.5KOHM+-1% 1/16W
R1156	AQ00212R	CHIP RESISTOR 4.7KOHM+-1% 1/16W
R1157	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1158	AQ00194R	CHIP RESISTOR 1.0KOHM+-1% 1/16W
R1159	0104545	CHIP RESISTOR 1.24KOHM+-1% 1/16W
R1162	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W[TYPE S/SE]
R1164	AQ00205R	CHIP RESISTOR 2.7KOHM+-1% 1/16W[TYPE S/SE]
R1165	AQ00194R	CHIP RESISTOR 1.0KOHM+-1% 1/16W[TYPE S/SE]
R1173	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1174	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R1175	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R1176	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R1177	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W

SYMBOL NO	P-NO	DESCRIPTION
R1178	AQ00192R	CHIP RESISTOR 820 OHM+-1% 1/16W
R1179	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R1201	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R1202	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1203	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1204	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R1205	AQ00223R	CHIP RESISTOR 12KOHM+-1% 1/16W
R1206	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1207	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R1208	0790068	CHIP RESISTOR 220KOHM+-5% 1/16W
R1209	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1210	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1211	0790072	CHIP RESISTOR 390KOHM+-5% 1/16W
R1214	0790027	CHIP RESISTOR 180OHM+-5% 1/16W
R1215	0790027	CHIP RESISTOR 180OHM+-5% 1/16W
R1216	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R1217	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R1220	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R1221	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1222	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R1229	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1230	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1231	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1250	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R1251	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R1252	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R1253	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R1254	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R1255	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1256	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1257	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1306	0103818	CHIP RESISTOR 8.2OHM+-10% 0.1W
R1307	0103813	CHIP RESISTOR 3.3 OHM+-10% 0.1W
R1308	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1309	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1310	0103818	CHIP RESISTOR 8.2OHM+-10% 0.1W
R1311	0103813	CHIP RESISTOR 3.3 OHM+-10% 0.1W
R1313	0103813	CHIP RESISTOR 3.3 OHM+-10% 0.1W
R1314	0103818	CHIP RESISTOR 8.2OHM+-10% 0.1W
R1315	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1316	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1317	0103813	CHIP RESISTOR 3.3 OHM+-10% 0.1W
R1318	0103818	CHIP RESISTOR 8.2OHM+-10% 0.1W
R1351	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R1352	0790069	CHIP RESISTOR 0.27MOHM+-5% 1/16W
R1353	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R1354	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1355	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1356	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R1357	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1358	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W
R1359	0790067	CHIP RESISTOR 180KOHM+-5% 1/16W
R1360	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R1361	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W
R1362	0790067	CHIP RESISTOR 180KOHM+-5% 1/16W
R1363	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R1364	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R1365	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R1366	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W
R1367	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R1368	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1370	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R1371	0790029	CHIP RESISTOR 270 OHM+-5% 1/16W
R1372	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R1374	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W

SYMBOL NO	P-NO	DESCRIPTION
R1375	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R1376	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R1378	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R1501	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R1505	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R1509	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R1510	AQ00231R	CHIP RESISTOR 24KOHM+-1% 1/16W
R1512	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R1515	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R1516	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1517	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R1519	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1520	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R1521	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R1522	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R1524	AQ01021R	CHIP RESISTOR 10KOHM+-0.5% 1/16W
R1525	AQ01007R	CHIP RESISTOR 1KOHM+-0.5% 1/16W
R1526	AQ01016R	CHIP RESISTOR 4.7KOHM+-0.5% 1/16W
R1527	AQ01027R	RESISTOR 33KOHM +-0.5% 1/16W
R1528	AQ01024R	RESISTOR 18KOHM +-0.5% 1/16W
R1529	AQ01021R	CHIP RESISTOR 10KOHM+-0.5% 1/16W
R1531	AQ01014R	CHIP RESISTOR 3.3KOHM +-0.5% 1/16W
R1532	AQ01021R	CHIP RESISTOR 10KOHM+-0.5% 1/16W
R1533	AQ01028R	CHIP RESISTOR 39KOHM +-0.5% 1/16W
R1534	AQ01029R	CHIP RESISTOR 47KOHM +-0.5% 1/16W
R1535	0105205	CHIP RESISTOR 510 OHM+-0.5% 1/16W
R1536	0105194	CHIP RESISTOR 2400OHM+-0.5% 1/16W
R1601	0103829	CHIP RESISTOR 68OHM+-5% 0.1W
R1605	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R1606	0104153	CHIP RESISTOR 470 OHM+-10% 0.125W
R1607	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1608	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1610	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R1611	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R1612	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1613	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R1614	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R1616	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1617	0790063	CHIP RESISTOR 82KOHM+-5% 1/16W
R1618	0790073	CHIP RESISTOR 470KOHM+-5% 1/16W
R1620	0790073	CHIP RESISTOR 470KOHM+-5% 1/16W
R1621	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R1625	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1626	AQ00205R	CHIP RESISTOR 2.7KOHM+-1% 1/16W
R1627	AQ00203R	CHIP RESISTOR 2.2KOHM+-1% 1/16W
R1628	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1629	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R1630	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R1639	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1640	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
RM1121	AQ00064R	CHIP RESISTOR 100KOHM+-5% 1/16W
RM1122	AQ00064R	CHIP RESISTOR 100KOHM+-5% 1/16W
RM1123	AQ00064R	CHIP RESISTOR 100KOHM+-5% 1/16W
RM1124	AQ00064R	CHIP RESISTOR 100KOHM+-5% 1/16W

SEMI-CONDUCTORS

D1002	CC10291R	DIODE 1SS353
D1151	5337352	DIODE MA132WA
D1171	5337471	DIODE KV1470
D1201	5337422	DIODE DA221
D1202	5337352	DIODE MA132WA
D1351	5337422	DIODE DA221
D1501	CC10291R	DIODE 1SS353
D1502	5337352	DIODE MA132WA

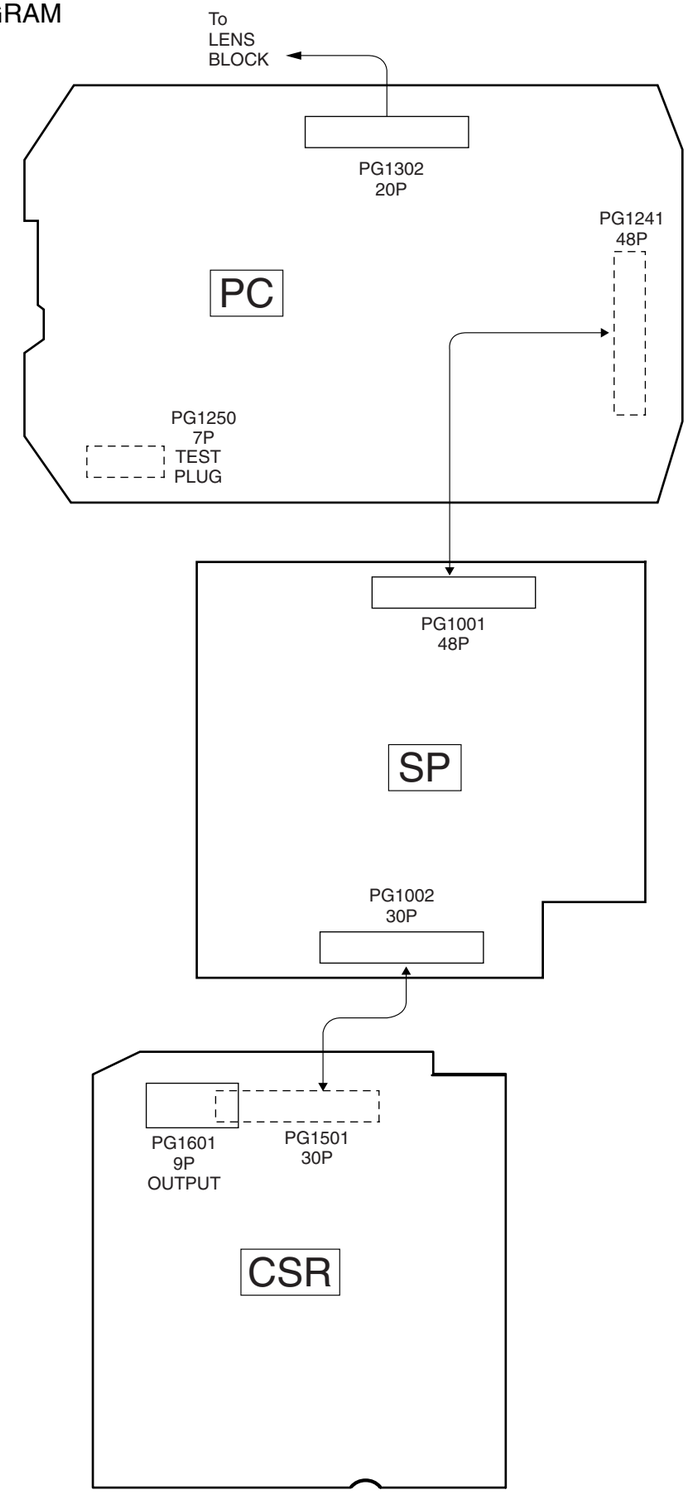
SYMBOL NO	P-NO	DESCRIPTION
D1503	CC10291R	DIODE 1SS353
D1601	5337391	DIODE D1FS4
D1602	CC10463R	DIODE MA3100L
IC1002	CK12061R	IC UPD16510GR
IC1101	CK21332U	IC HD49323AF
IC1121	CK22461U	IC HG73C053FE
IC1122	CK23712U	IC MSM51V18165F-60TS
IC1173	CK15051R	IC TC7SU04FU
IC1174	CK18421R	IC TC7SHU04FUL
IC1202	CK21351R	IC X25097V1-2.7
IC1204	CK20501R	IC TC7SH14FU
IC1205	CK20501R	IC TC7SH14FU
IC1206	CK16201R	IC TC7S08FU
IC1251	CK20403R	IC RN5VD27AA
IC1301	1366804	IC MPC17AT85VM
IC1302	1366804	IC MPC17AT85VM
IC1351	CK20621R	IC UPD5023GS-147-GJG
IC1501	1366251	IC TL1464IPT
IC1601	CK23321R	IC BA7664FV
IC1602	1366081	IC HD74HCT125T
IC1603	CK23291R	IC 74VHC4046MTCX
IC1604	5305831	IC IDC-7S08
Q1001	5328221	TRANSISTOR 2SC2620-QC
Q1151	5328192	TRANSISTOR 2SC2462LD
Q1152	1323231	TRANSISTOR 2SB1462
Q1153	1323231	TRANSISTOR 2SB1462[TYPE S/SE]
Q1201	1323286	TRANSISTOR UMH9N
Q1351	5328192	TRANSISTOR 2SC2462LD
Q1352	5328974	TRANSISTOR 2SC2412KBRST
Q1353	1323142	TRANSISTOR STC-2411K-Q
Q1501	1308011	TRANSISTOR MPL1
Q1502	1308011	TRANSISTOR MPL1
Q1503	1308011	TRANSISTOR MPL1
Q1504	CA10271R	TRANSISTOR 2SB1424
Q1506	5326422	TRANSISTOR 2SC4081
Q1601	1323273	TRANSISTOR DTA143EE
Q1602	1323271	TRANSISTOR DTC144EE
Q1603	1323279	TRANSISTOR DTC114YE
Q1605	1323231	TRANSISTOR 2SB1462
Q1607	5328221	TRANSISTOR 2SC2620-QC
Q1609	1323253	TRANSISTOR XP4401
Q1610	1323291	TRANSISTOR 2SC4617
Q1611	1323231	TRANSISTOR 2SB1462
ZD1171	CC10433R	DIODE(MA3030L)
		TRANSFORMER
T1501	BC10261R	TRANS
		COILS
L1001	0773118	CHOKE COIL 10UH+-5%
L1101	0773118	CHOKE COIL 10UH+-5%
L1102	0773118	CHOKE COIL 10UH+-5%
L1103	0773118	CHOKE COIL 10UH+-5%
L1201	0773118	CHOKE COIL 10UH+-5%
L1202	0773118	CHOKE COIL 10UH+-5%
L1301	BA10693R	COIL 22UH
L1302	0773118	CHOKE COIL 10UH+-5%
L1501	0773089	COIL CHOKE 22UH
L1503	BA10696R	COIL 68UH
L1504	BA10693R	COIL 22UH
L1505	BA10695R	COIL 47UH
L1506	0773004	COIL 100UH
L1507	0773004	COIL 100UH

SYMBOL NO	P-NO	DESCRIPTION
L1601	0773118	CHOKE COIL 10UH+-5%
L1602	0773123	CHOKE COIL 22UH+-5%
L1603	0773132	CHOKE COIL 100UH+-5%[TYPE S/SE]
		CRYSTALS
X1172	BL10681R	CRYSTAL 28.6MHz[TYPE S/K]
X1172	BL10682R	CRYSTAL 28.5MHz[TYPE SE/KE]
		MISCELLANEOUS
BL1121	BM00137R	FILTER
BL1122	BM00137R	FILTER
BL1601	BM00158R	FILTER
BL1602	BM00152R	FILTER
⚠ F1601	5723235	FUSE 1A
PG1001	1830315	CONNECTOR
PG1002	1830091	CONNECTOR
PG1241	1830316	CONNECTOR
PG1250	EA11356R	PLUG
PG1302	EA10407R	CONNECTOR
PG1501	1830101	CONNECTOR
PG1601	5666914	MINI PLUG

CHAPTER 6

SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS/MICROPROCESSOR PIN FUNCTION TABLE

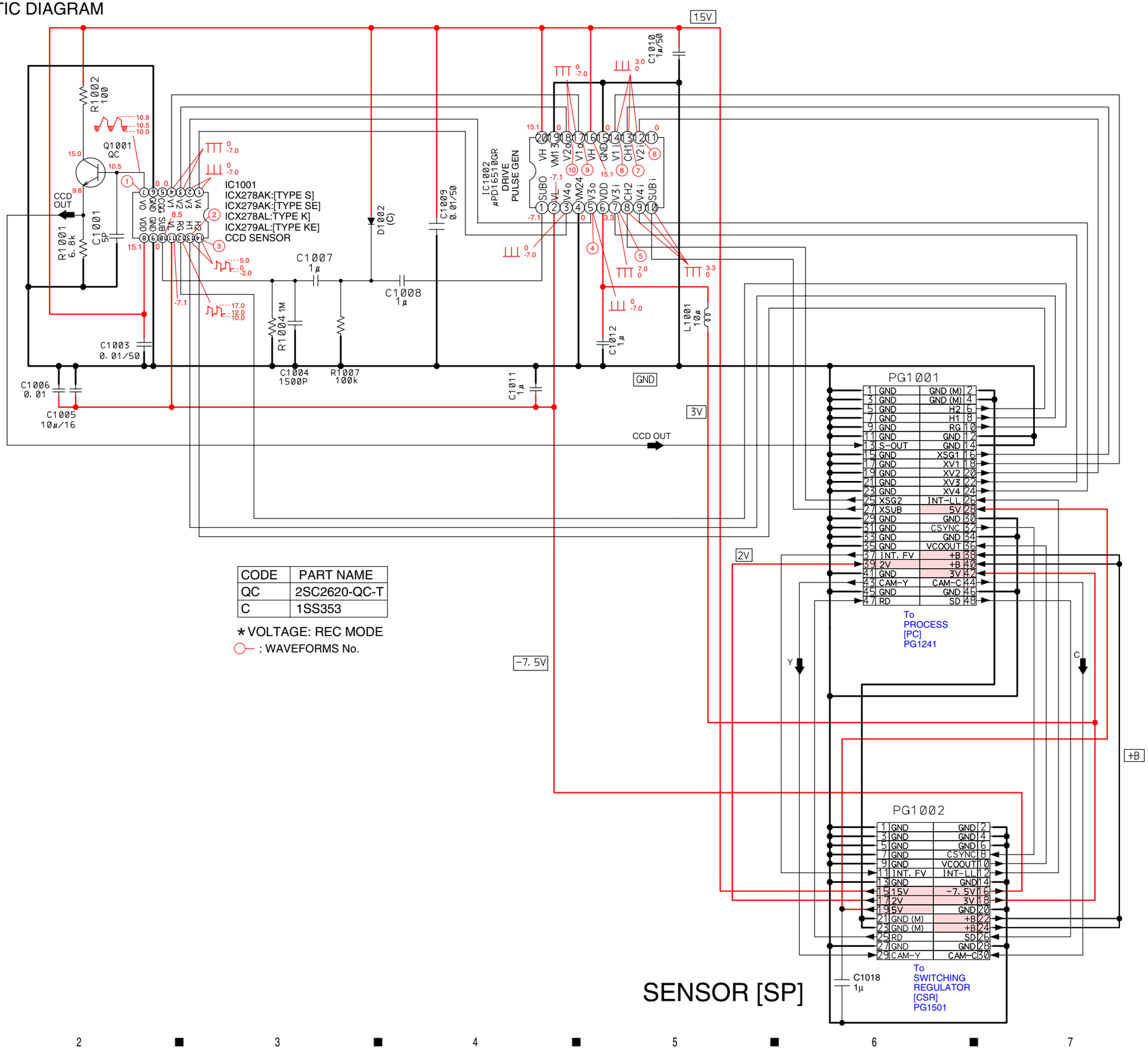
CONNECTION DIAGRAM



WAVEFORMS

1 IC1001-7 1.1Vp-p 0.2V/20.0µs COLOR CHART	7 IC1002-13 3.1Vp-p 1V/5.0ms COLOR CHART	13 IC1101-27 1.1Vp-p 0.2V/20.0µs COLOR CHART	19 Q1153-B 550mVp-p 0.2V/20.0µs COLOR CHART [For TYPE S/SE]
2 IC1001-13 6.0Vp-p 2V/100ns COLOR CHART	8 IC1002-14 3.1Vp-p 1V/20.0µs COLOR CHART	14 IC1201-38 3.0Vp-p 1V/5.0ms COLOR CHART	
3 IC1001-14 6.0Vp-p 2V/100ns COLOR CHART	9 IC1002-17 6.5Vp-p 2V/20.0µs COLOR CHART	15 IC1201-72 3.0Vp-p 1V/20.0µs COLOR CHART	
4 IC1002-5 6.5Vp-p 2V/20.0µs COLOR CHART	10 IC1002-18 6.5Vp-p 2V/20.0µs COLOR CHART	16 IC1201-75 3.0Vp-p 1V/5.0ms COLOR CHART	
5 IC1002-7 3.1Vp-p 1V/20.0µs COLOR CHART	11 IC1101-18 4.2Vp-p 1V/50.0ns COLOR CHART	17 IC1201-78 3.0Vp-p 1V/5.0ms COLOR CHART	
6 IC1002-12 3.1Vp-p 1V/20.0µs COLOR CHART	12 IC1101-19 4.2Vp-p 1V/50.0ns COLOR CHART	18 Q1152-B 1.0Vp-p 0.2V/20.0µs COLOR CHART	

SENSOR [SP] SCHEMATIC DIAGRAM



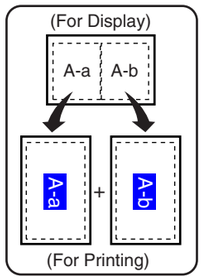
CODE	PART NAME
QC	2SC2620-QC-T
C	1SS353

∗VOLTAGE: REC MODE

◯— : WAVEFORMS No.

SENSOR [SP]

PROCESS [RC] SCHEMATIC DIAGRAM (For Display)



CODE	PART NAME
AR	2SB1462
BR	2SC2412KBRST
CQ	STC-2411K-Q
E2	TC7S08FU
E6	TC7SU04FU
LD	2SC2462-LD-T
HA	TC7SH14FU
H6	TC7SHU04FUL
H9	UMH9N
F7	KV1470-T
K	DA221
MO	MA132WA
3.0L	MA3030L-T

★VOLTAGE: REC MODE

○— : WAVEFORMS No.

PG1241

1	GND	GND (M)	2
3	GND	GND (M)	4
5	GND	H2	6
7	GND	H1	8
9	GND	RG	10
11	GND	GND	12
13	S-OUT	GND	14
15	GND	XSG1	16
17	GND	XV1	18
19	GND	XV2	20
21	GND	XV3	22
23	GND	XV4	24
25	XSG2	INT-LL	26
27	XSUB	5V	28
29	GND	GND	30
31	GND	CSYNC	32
33	GND	GND	34
35	GND	VCCOUT	36
37	INT. FV	+B	38
39	2V	+B	40
41	GND	3V	42
43	CAM-Y	CAM-C	44
45	GND	GND	46
47	RD	SD	48

To SENSOR [SP] PG1001

PG1302

FOCUS A−	20	TL1350
FOCUS B−	19	TL1349
FOCUS B+	18	TL1348
FOCUS A+	17	TL1347
FOCUS VCC	16	TL1346
FOCUS SENSE	15	TL1345
FOCUS LED	14	TL1344
DRIVE−	13	
HALL OUT−	12	
HALL IN−	11	
HALL OUT+	10	
HALL IN+	9	
DRIVE+	8	
ZOOM VCC	7	TL1336
ZOOM SENSE	6	TL1335
ZOOM LED	5	TL1334
ZOOM A−	4	TL1333
ZOOM B−	3	TL1332
ZOOM B+	2	TL1331
ZOOM A+	1	

To LENS BLOCK

PG1250 TEST PLUG

7	GND
6	3.3V
5	RST
4	MD2
3	FWE
2	RXD
1	TXD

IC1101 HD49323AF CDS/AGC & A/D CONV

IC1121 HG73C053FE CAMERA DSP

IC1122 M5M51V18165F-60TS DRAM

IC1201 HD64F2238AFA13-S274 DIGITAL uP (D-uP)

IC1202 X25097V1-2.7 EEPROM

IC1251 RN5VD27AA

IC1301 MPC17A785M ZOOM MOTOR DRIVE

IC1302 MPC17A785M FOCUS MOTOR DRIVE

IC1351 UPC5023GS-147GJG F.DET/IRIS DRIVE

CCD OUT

DIGITAL CCD OUT

AD [10]

ADR [10]

MIFIO [16]

(3V) (2V) (5V) (GND) (GND(M)) (FV) (SD) (RD) (+B) (GND (M))

HI : INT
LO : L. L.

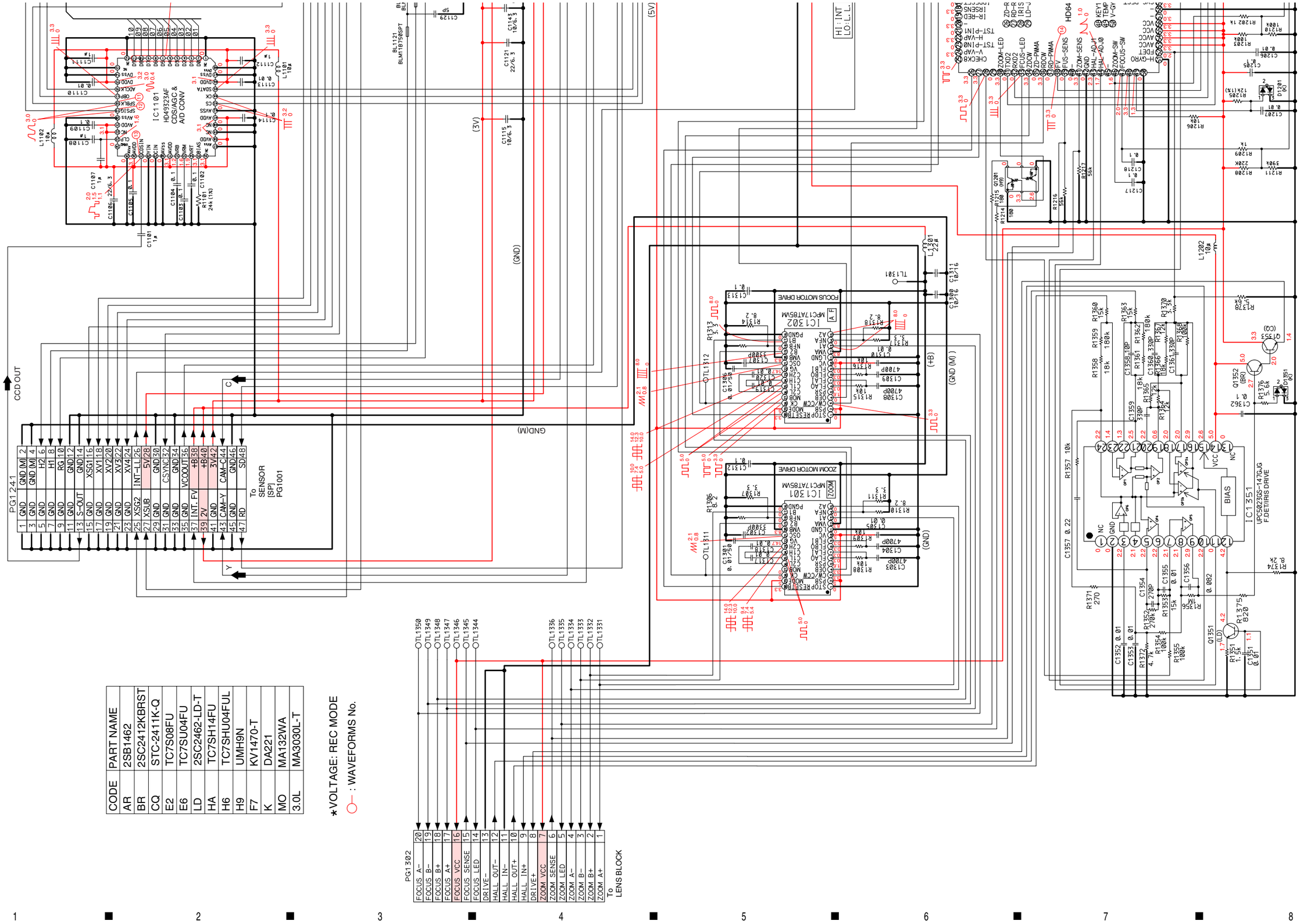
RESET PULSE GEN

[TYPE S/SE] [TYPE KK/E]

(CAM C) (CAM Y)

∗X1172
28.6MHz:[TYPE S/K]
28.5MHz:[TYPE SE/KE]

PROCESS [PC]

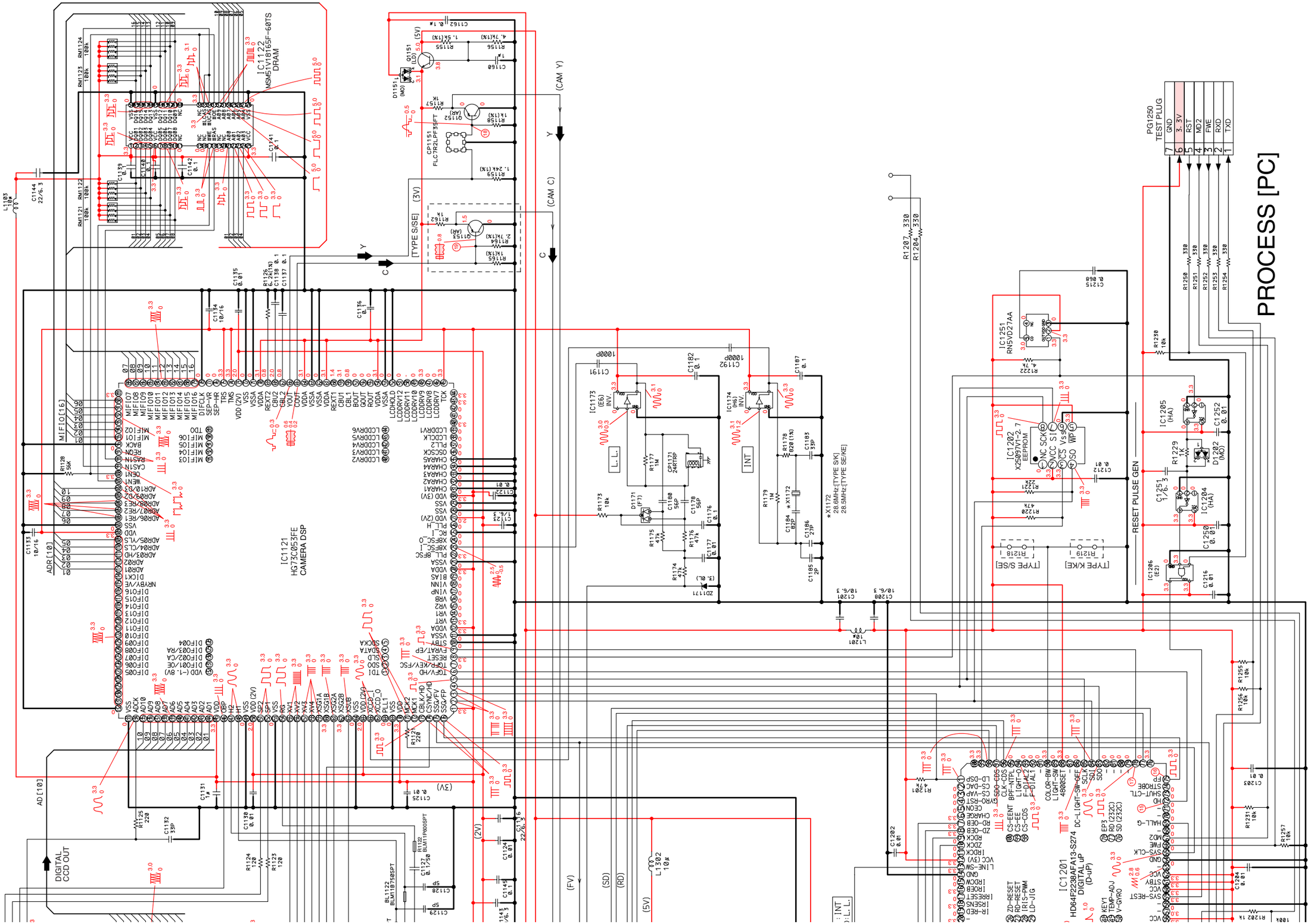


CODE	PART NAME
AR	2SB1462
BR	2SC2412KBRST
CQ	STC-2411K-Q
E2	TC7S08FU
E6	TC7SU04FU
LD	2SC2462-LD-T
HA	TC7SH14FU
H6	TC7SHU04FUL
H9	UMH9N
F7	KV1470-T
K	DA221
MO	MA132WA
3.0L	MA3030L-T

★VOLTAGE: REC MODE

○— : WAVEFORMS No.

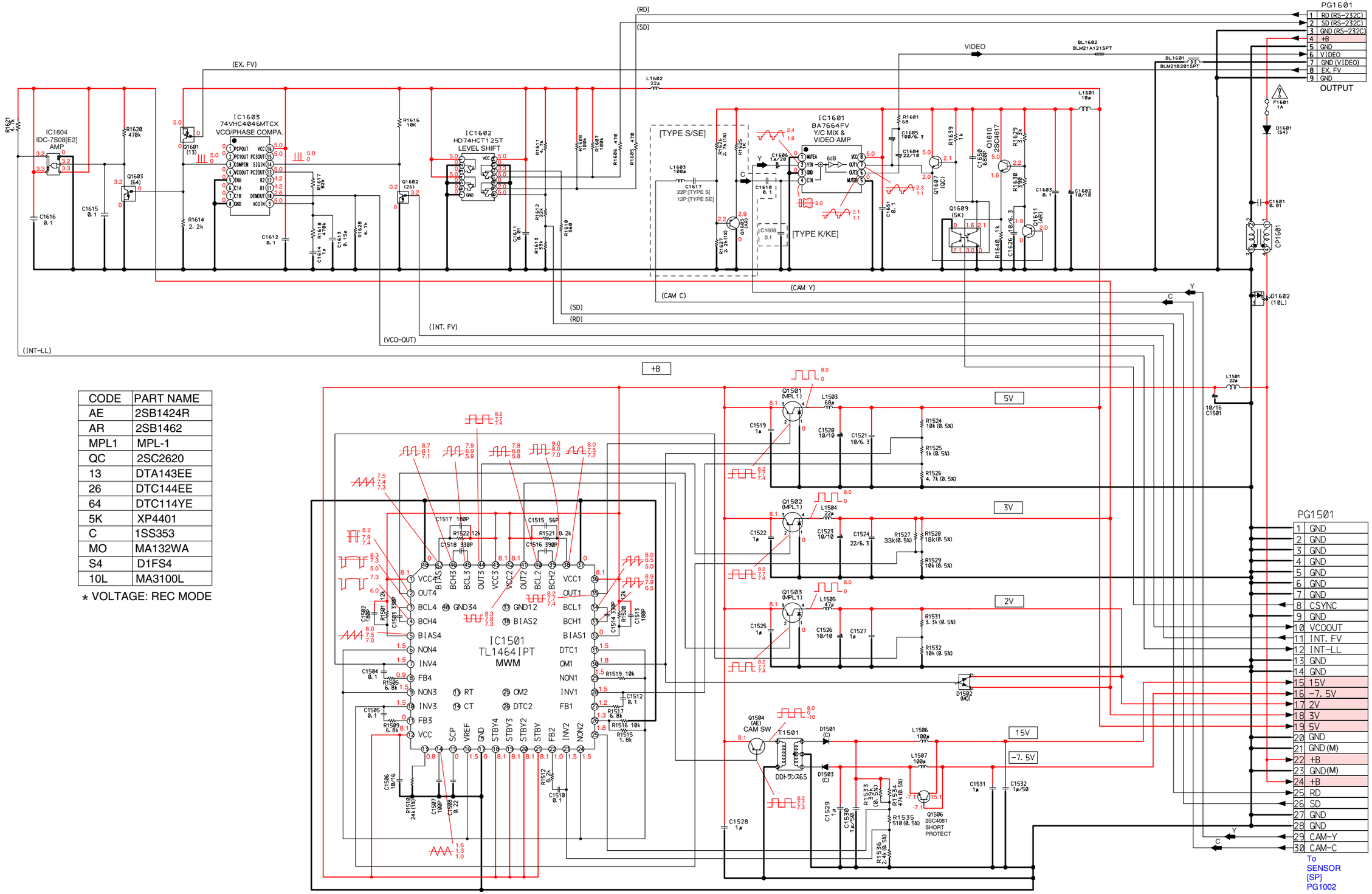
PROCESS [PC] SCHEMATIC DIAGRAM (For Printing) **A-b**



SWITCHING REGULATOR [CSR] SCHEMATIC DIAGRAM

CODE	PART NAME
AE	2SB1424R
AR	2SB1462
MPL1	MPL-1
QC	2SC2620
13	DTA143EE
26	DTC144EE
64	DTC114YE
5K	XP4401
C	1SS353
MO	MA132WA
S4	D1FS4
10L	MA3100L

* VOLTAGE: REC MODE



SWITCHING REGULATOR [CSR]

IDENTIFICATION OF PARTS LOCATION

SP

Symbol No.	Parts Location
C	
C1001	B-3B
C1003	B-2B
C1004	B-1B
C1005	A-1B
C1006	B-2B
C1007	B-1B
C1008	B-1B
C1009	B-2A
C1010	B-2A
C1011	B-2A
C1012	B-2A
C1018	B-1B
D	
D1002	B-1B
IC	
IC1001	B-2B
IC1002	B-2A
L	
L1001	B-3A
PG	
PG1001	B-3B
PG1002	B-1B
Q	
Q1001	B-3B
R	
R1001	B-3B
R1002	B-3B
R1004	B-1B
R1007	B-1B

PC

Symbol No.	Parts Location
BL	
BL1121	A-2B
BL1122	A-2B
C	
C1101	B-1B
C1102	B-1A
C1103	B-1A
C1104	B-1A
C1105	B-1B
C1106	A-1A
C1107	B-1B
C1108	B-1B
C1109	B-1B
C1110	B-1B
C1111	B-1B
C1112	B-1A
C1113	B-1A
C1114	B-1A
C1115	A-1A
C1116	A-2A
C1121	A-2A
C1122	B-3B
C1123	B-3B
C1124	B-2A
C1125	B-3A
C1127	A-2B
C1128	A-2B
C1129	A-2B
C1130	B-2A
C1131	B-2A
C1132	B-1B
C1133	B-1B
C1134	B-2C
C1135	B-2C
C1136	B-2C
C1137	B-2C
C1138	B-2C
C1139	A-2C
C1140	A-2C
C1141	A-2B
C1142	A-2C
C1143	A-2A
C1144	A-2C
C1145	B-2A
C1160	B-1C
C1162	B-1C
C1176	A-4A
C1177	A-4A
C1178	A-4A
C1180	B-5A
C1182	B-5B
C1183	A-4A
C1184	A-3A
C1185	A-3A
C1186	A-4A
C1187	A-4A
C1191	A-5B
C1192	A-3A
C1201	A-2A
C1202	B-4A
C1203	B-4B
C1204	B-4B
C1205	B-4B
C1206	B-4B
C1207	B-4B
C1208	A-3A
C1212	A-3A
C1215	A-3A
C1216	B-3B
C1217	B-5B
C1218	B-5B
C1250	B-3B
C1251	B-3B
C1252	B-3B
C1300	A-3C
C1301	B-4B
C1302	B-4B
C1303	B-3C
C1304	B-3C
C1305	B-4C
C1306	B-5C
C1307	B-5C
C1308	B-4C
C1309	B-4C
C1310	B-4C
C1311	A-3C
C1312	B-4C
C1313	B-4C
C1317	B-4C
C1318	B-4C
C1319	B-5C
C1320	B-5C
C1351	A-5B
C1352	A-5B
C1353	A-4C
C1354	A-5C
C1355	A-5C
C1356	A-5B
C1357	A-5C
C1358	A-4C
C1359	A-4C
C1360	A-4C
C1361	A-4C
C1362	A-4C
CP	
CP1151	B-2C
CP1171	A-5A
D	
D1151	B-2C
D1171	A-4A
D1201	B-5B
D1202	B-3B
D1351	A-5B
IC	
IC1101	B-1A
IC1121	B-2B
IC1122	A-2C
IC1173	B-5B
IC1174	A-3A
IC1201	B-4A
IC1202	A-3A
IC1204	B-3B
IC1205	B-3B
IC1206	B-4B
IC1251	A-3A
IC1301	B-4B
IC1302	B-5C
IC1351	A-5C
L	
L1101	A-2B
L1102	B-1A
L1103	A-2C
L1201	A-3A
L1202	A-4C
L1301	A-3C
L1302	B-4C
PG	
PG1241	A-1B
PG1250	A-5A
PG1302	B-3C
Q	
Q1151	B-1C
Q1152	B-1C
Q1153	B-2C
Q1201	B-5A
Q1351	A-5B
Q1352	A-5B
Q1353	A-5B
R	
R1101	B-1A
R1121	B-3A
R1122	A-2B
R1123	B-2A
R1124	B-2A
R1125	B-1B
R1126	B-2C
R1128	B-1C
R1155	B-1C
R1156	B-1C
R1157	B-2C
R1158	B-1C
R1159	B-2C
R1162	B-2C
R1164	B-2C
R1165	B-2C
R1173	A-4A
R1174	A-4A
R1175	A-4A
R1176	A-4A
R1177	B-5A
R1178	A-4A
R1179	A-4A
R1201	B-4A
R1202	B-5B
R1203	B-5B
R1204	A-2A
R1205	B-5B
R1206	B-5B
R1207	A-2A
R1208	B-5B
R1209	B-5B
R1210	B-5B
R1211	B-5B
R1214	B-5A
R1215	B-5A
R1216	B-5B
R1217	B-5B
R1218	B-3A
R1219	B-3A
R1220	A-3A
R1221	A-3A
R1222	A-3A
R1229	B-3B
R1230	B-5A
R1231	B-5A
R1250	B-5A
R1251	B-5A
R1252	A-5A
R1253	A-5A
R1254	A-5A
R1255	A-5A
R1256	A-5A
R1257	B-4B
R1306	B-4B
R1307	B-4B
R1308	B-3C
R1309	B-3C
R1310	B-5B
R1311	B-5B
R1313	B-5C
R1314	B-5C
R1315	B-4C
R1316	B-4C
R1317	B-5C
R1318	B-5C
R1351	A-5B
R1352	A-5C
R1353	A-5C
R1354	A-5C
R1355	B-5B
R1356	A-5C
R1357	A-4C
R1358	A-4C
R1359	A-4C
R1360	A-4C
R1361	A-4C
R1362	A-4C
R1363	A-3C
R1364	A-4C
R1365	A-4C
R1366	A-4C
R1367	A-4C
R1368	A-4C
R1370	A-4C
R1371	A-4C
R1372	A-4C
R1374	A-5B
R1375	A-5B
R1376	A-5B
R1378	A-4B
RM	
RM1121	A-2C
RM1122	A-2C
RM1123	B-1C
RM1124	B-1C
TL	
TL1301	B-4C
TL1311	A-4C
TL1312	B-5C
TL1331	B-3A
TL1332	B-3A
TL1333	B-3C
TL1334	B-2A
TL1335	B-3C
TL1336	B-3C
TL1344	B-3C
TL1345	B-3C
TL1346	B-4C
TL1347	B-3A
TL1348	B-3C
TL1349	B-3C
TL1350	B-3C
X	
X1172	A-4A
X1172	A-4A
ZD	
ZD1171	A-4A

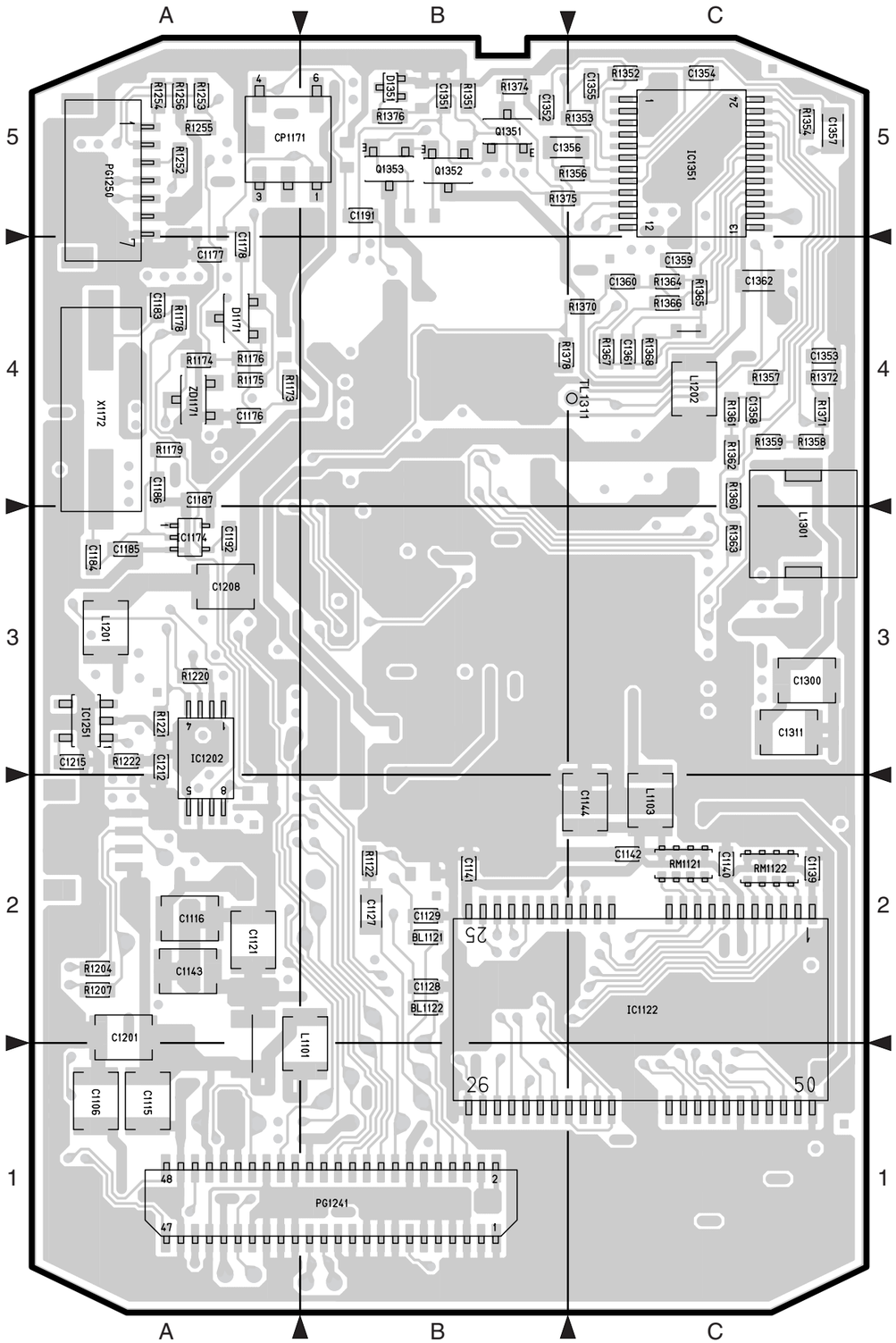
CSR

Symbol No.	Parts Location
BL	
BL1601	B-3C
BL1602	A-3C
C	
C1501	A-3A
C1502	B-2A
C1503	B-2A
C1504	B-3A
C1505	B-3A
C1506	B-3A
C1507	B-3A
C1508	B-3A
C1510	B-3A
C1512	B-3B
C1513	B-2B
C1514	B-3B
C1515	B-2B
C1516	B-2A
C1517	B-2A
C1518	B-2A
C1519	B-2A
C1520	A-2A
C1521	B-2A
C1522	B-1A
C1523	A-1A
C1524	B-1A
C1525	B-1A
C1526	A-2A
C1527	B-1A
C1528	B-1B
C1529	B-1B
C1530	B-1B
C1531	B-2B
C1532	B-2B
C1601	A-3C
C1602	A-3C
C1603	A-2C
C1604	A-3C
C1605	A-2C
C1606	A-2C
C1608	A-2C
C1610	A-3C
C1611	B-1C
C1612	B-1C
C1613	B-1B
C1614	B-1B
C1615	A-1C
C1616	A-1C
C1617	A-3C
C1626	B-2C
C1650	B-2C
C1651	A-2C
CP	
CP1601	A-3C
D	
D1501	A-2B
D1502	B-1A
D1503	A-2B

Symbol No.	Parts Location
D1601	B-3C
D1602	B-3A
F	
F1601	B-3C
IC	
IC1501	B-3A
IC1601	A-2C
IC1602	B-1C
IC1603	B-1B
IC1604	A-1C
L	
L1501	A-3A
L1503	A-2A
L1504	A-1A
L1505	A-1A
L1506	B-2B
L1507	B-2B
L1601	A-2C
L1602	A-1B
L1603	A-3C
PG	
PG1501	A-3B
PG1601	B-3C
Q	
Q1501	B-2A
Q1502	B-1A
Q1503	B-1A
Q1504	B-1B
Q1506	B-2B
Q1601	B-1C
Q1602	B-1C
Q1603	A-1C
Q1605	A-3C
Q1607	B-2C
Q1609	B-2C
Q1610	B-2C
Q1611	B-3C
R	
R1501	B-2A
R1505	B-3A
R1509	B-3A
R1510	B-3A
R1512	B-3A
R1515	B-3B
R1516	B-3B
R1517	B-3B
R1519	B-3B
R1520	B-2B
R1521	B-2B
R1522	B-2A
R1524	B-2A
R1525	B-2A
R1526	B-2A
R1527	B-1A
R1528	B-1A
R1529	B-1A
R1531	B-2A
R1532	B-1A

Symbol No.	Parts Location
R1533	A-2B
R1534	A-2B
R1535	A-2B
R1536	A-2B
R1601	A-3B
R1605	B-2C
R1606	B-2C
R1607	B-2C
R1608	B-1C
R1610	B-2C
R1611	B-2C
R1612	B-1C
R1613	B-1C
R1614	B-1B
R1616	B-1C
R1617	B-1B
R1618	B-1B
R1620	A-1C
R1621	A-1C
R1625	A-3C
R1626	A-3C
R1627	A-3C
R1628	B-1B
R1629	B-2C
R1630	B-2C
R1639	B-2C
R1640	B-3C
T	
T1501	A-2B

PC CIRCUIT BOARD DIAGRAM



PC [PROCESS] -SIDE A-

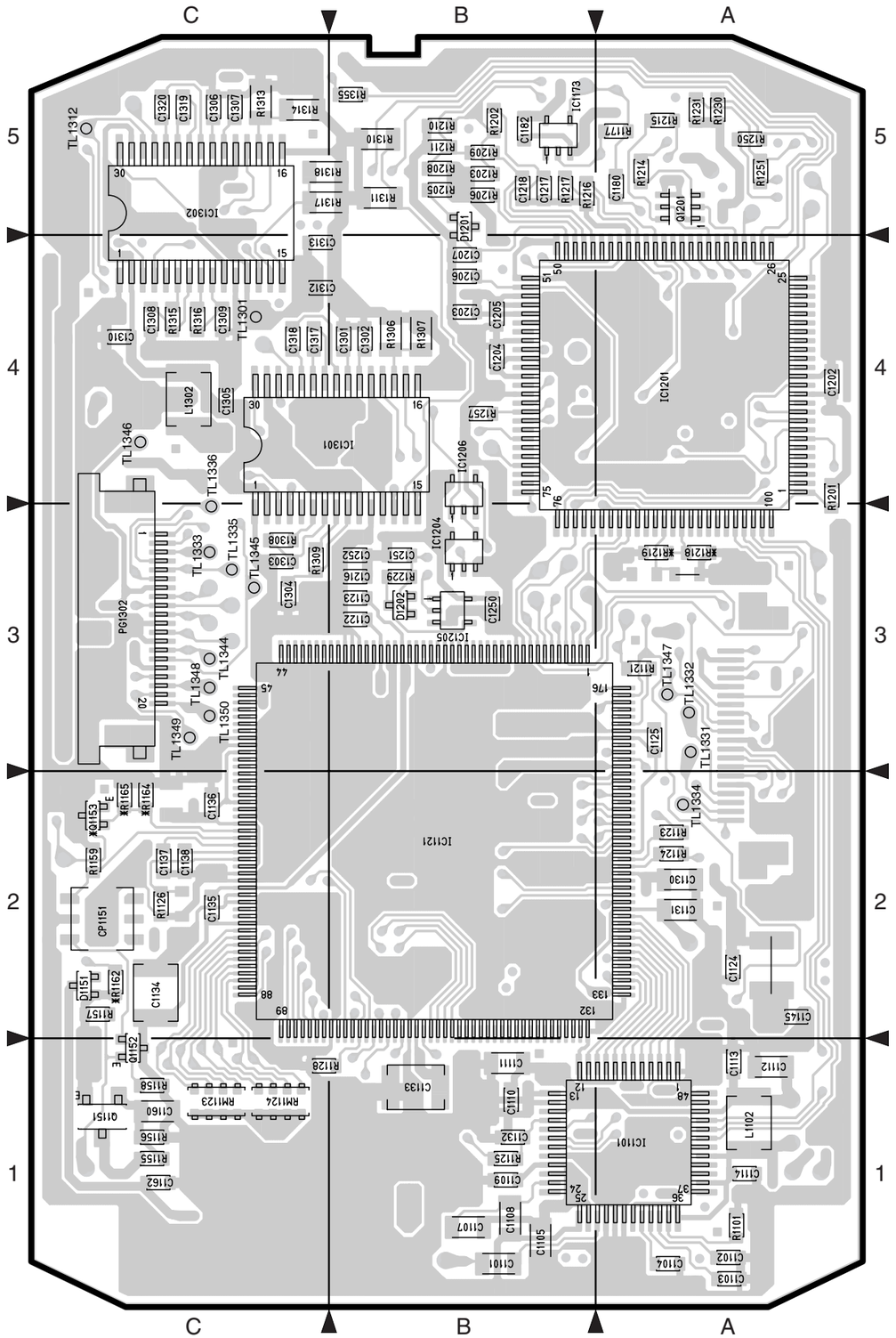
DIFFERENCE TABLE

PC [PROCESS]

NOTE: This table listes the different components marked with asterisks (✱) in the circuit board diagrams.

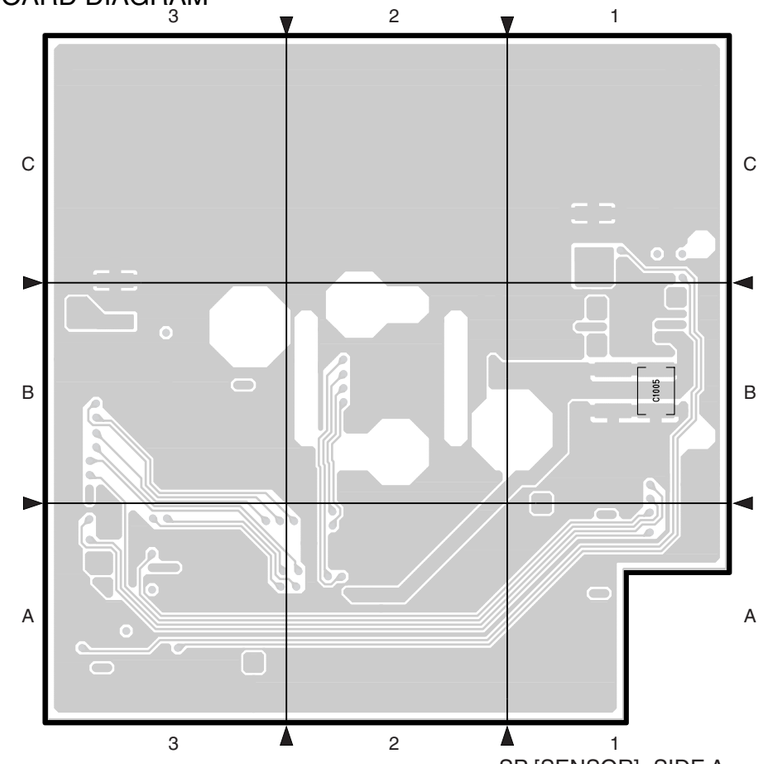
SYMBOL No.	TYPE S	TYPE SE	TYPE K	TYPE KE	Parts Location
Q1153	○	○	×	×	B-2C
R1162	○	○	×	×	B-2C
R1164	○	○	×	×	B-2C
R1165	○	○	×	×	B-2C
R1218	JUMPER	JUMPER	×	×	B-3A
R1219	×	×	JUMPER	JUMPER	B-3A

○ : Provided
× : Not Provided

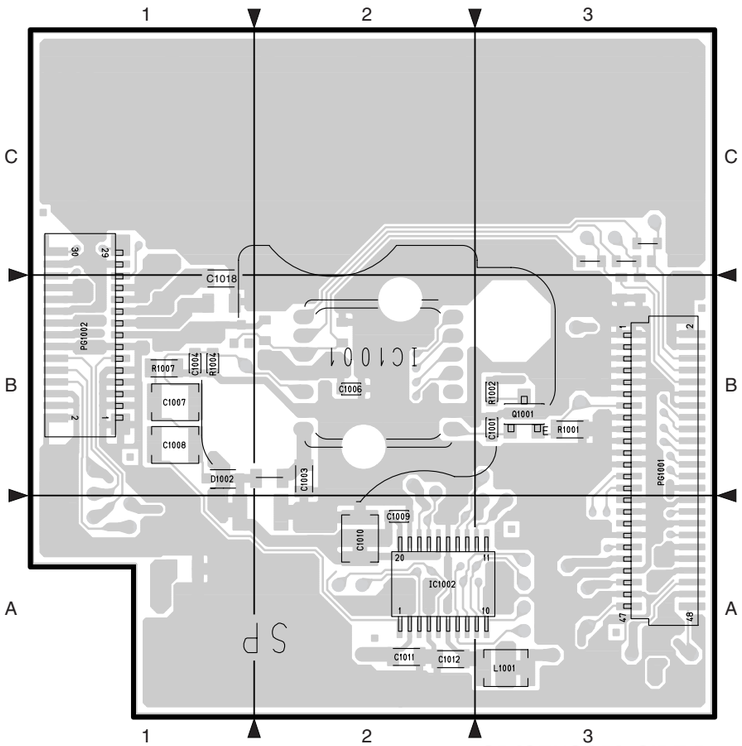


PC [PROCESS] -SIDE B-
[PATTERN No.JA1936-2]

SP CIRCUIT BOARD DIAGRAM



SP [SENSOR] -SIDE A-



SP [SENSOR] -SIDE B-
[PATTERN No.JA1936-2]

CSR CIRCUIT BOARD DIAGRAM

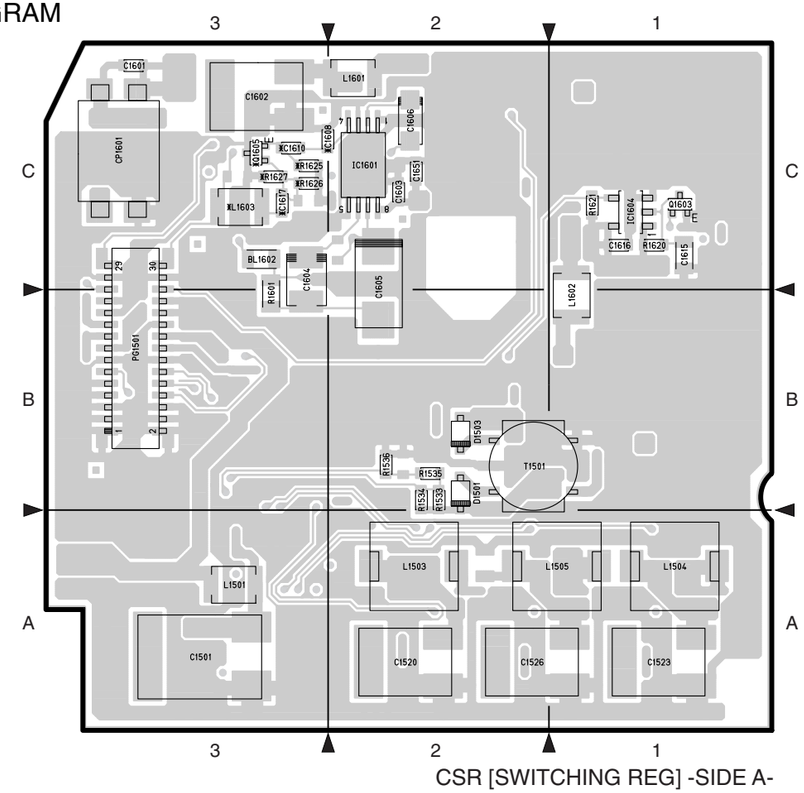
DIFFERENCE TABLE

CSR [SWITCHING REGULATOR]

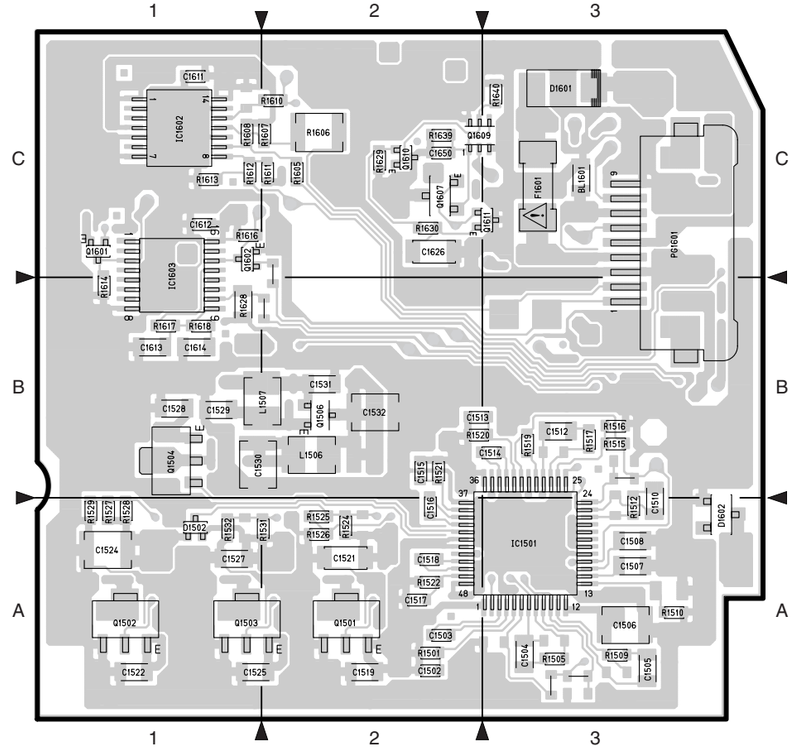
NOTE: This table listes the different components marked with asterisks (*) in the circuit board diagrams.

SYMBOL No.	TYPE S	TYPE SE	TYPE K	TYPE KE	Parts Location
C1608	×	×	○	○	A-2C
C1610	○	○	×	×	A-3C
C1617	○	○	×	×	A-3C
L1603	○	○	×	×	A-3C
Q1605	○	○	×	×	A-3C
R1625	○	○	×	×	A-3C
R1626	○	○	×	×	A-3C
R1627	○	○	×	×	A-3C

○ : Provided
× : Not Provided



CSR [SWITCHING REG] -SIDE A-



CSR [SWITCHING REG] -SIDE B-
[PATTERN No.JA1936-2]

BLOCK DIAGRAM
OVERALL

	TYPE S	TYPE SE	TYPE K	TYPE KE
Q1605	Provided		Not Provided	
L1603				
C1617				
BPF	3.58MHz	4.43MHz		

SP (1/2)

IC1001 CCD SENSOR
Q1001 BUF.
PG1001 (1/2)
PG1241 (1/2)
IC1101 CDS/AGC & A/D CONV
CDS
AGC
A/D
IC1121 CAMERA DSP
IC1122 DRAM
AUTO FOCUS DET.
Y/CHROMA DIGITAL PROCESS
PULSE GEN.
D/A
V1,V2 V3,V4
H1,H2, RG
SP1, SP2, OBP
DATA, CLOCK, CS
ADCK
IC1002 SENSOR DRIVE
XV1,XV2,XV3,XV4 XSG1,XSG2,XSUB
HD,EP3, FV,FP
RESET
FV
FSC
C,SYNC
CHROMA
CP1151 LPF
Q1153 BUF.
Q1152 BUF.
Y
PG1241 (2/2)
PG1001 (2/2)
PG1002
PG1501
★L1603, ★C1617
★BPF
Q1605 BUF.
IC1601 Y/C MIX & VIDEO AMP
PG1601 OUTPUT
VIDEO
EX.FV
Q1607,Q1609, Q1610,Q1611
C.CLIP
Q1602 INT.FV SW
Q1601 EXT.FV SW
IC1603 VCO/PHASE COMPA.
PHASE COMPA.
VCO
LL. OSC
IC1173 INV.
CP1171
VCO OUT
INT-LL
IC1604 FV PULSE GEN.
Q1603 BUF.
IC1602 LEVEL SHIFT
SD
RD
SD(RS-232C)
RD(RS-232C)
HD,EP3 FV,FP
DATA, CLOCK, CS
LD-DSP
DATA, CLOCK
MCK2 (9.5MHz)
XCCDI
SYS-CLK
SYS-REST
IC1204-1206, IC1251 RESET PULSE GEN.
IC1174 CLOCK GEN
X1172
TYPE S/K: 28.6MHz
TYPE SE/KE: 28.5MHz
IRIS PWM
IC1201 CAMERA µP
LINE-SW
SD(232C)
RD(232C)
IC1202 EEPROM
DATA
CLOCK
CS
CS-EE
MD2
FWE
RXD2
TXD2
TEMP-ADJ
D1201
PG1250 TEST PLUG
RST
MD2
FWE
RXD
TXD
IC1351 F.DET/IRIS DRIVE
PG1302
Q1352, Q1353 IRIS DRIVE
IRIS MOTOR
HALL DEVICE
F.DET
BIAS
Q1351 BIAS DRIVE
HAL-ADJ1
F.DET
HALL-G
HAL-ADJ0
IC1301 ZOOM MOTOR DRIVE
ZOOM MOTOR
DRIVE
DECORD
ZD-RESET
ZDCK
ZD-OEB
ZDCW
IC1302 FOCUS MOTOR DRIVE
FOCUS MOTOR
RD-RESET
RDCK
RD-OEB
RDCW
ZOOM SENSOR
ZOOM LED
FOCUS SENSOR
FOCUS LED
ZOM-SENS
FUS-SENS
ZOOM-LED
FCUS-LED
Q1201 LED DRIVE
B+
5V
3V
2V
15V
-7.5V
IC1501 PWM
5V PWM
3V PWM
2V PWM
PWM
VCC1-4
VCC
STBY4
STBY3
STBY2
STBY
Q1501 5V SW
Q1502 3V SW
Q1503 2V SW
Q1504 CAM SW
D1501
T1501
D1503
Q1506 SHORT PROTECT
CP1601
F1601
B+
GND

PC

SP (2/2)

CSR

MICROPROCESSOR PIN FUNCTION TABLES

DIGITAL MICROPROCESSOR (IC1201: D-µP)

Pin No.	I/O	Active Level	Abbreviation	Function
1	O	(Pulse)	LD-DSP	Activates data communication with IC1121 (CAMERA DSP).
2	O	(Pulse)	CS-DAC	Not used. Open.
3	O	(Pulse)	CS-VAP	
4	O	Hi	GYRO-RST	
5	-----	-----	CEON	
6	-----	-----	CHARGE	
7	O	(Pulse)	RD-OEB	Activates focus drive data communications with IC1302 (FOCUS MOTOR DRIVE).
8	O	(Pulse)	ZD-OEB	Activates zoom drive data communications with IC1301 (ZOOM MOTOR DRIVE).
9	O	(Pulse)	RDCK	Outputs focus motor drive signal to IC1302 (FOCUS MOTOR DRIVE).
10	O	(Pulse)	ZDCK	Outputs zoom motor drive signal to IC1301 (ZOOM MOTOR DRIVE).
11	O	(Pulse)	IRDCK	Not used. Open.
12	-----	-----	VCC (3V)	3V power input.
13	I	Hi/Lo	LINE-SW	External sync detection input. When "Hi" is input, the unit will be driven in the external sync mode; when "Lo" is input, it will be driven in the internal sync mode.
14	-----	-----	GND	Ground.
15	O	Hi/Lo	IRDCW	Not used. Open..
16	O	(Pulse)	IROREB	
17	O	Hi	IRRESET	
18	I	(Pulse)	IRSENS	
19	O	-----	IR-RED	
20	-----	-----	----------	
21	-----	-----	TST-PIN1	
22	I	0V-3V	H-VAP	
23	-----	-----	TET-PIN0	
24	I	0V-3V	V-VAP	
25	-----	-----	CHECK8	
26	O	Hi	ZD-RESET	Resets IC1301 (ZOOM MOTOR DRIVE).
27	O	Hi	RD-RESET	Resets IC1302 (FOCUS MOTOR DRIVE).
28	O	(Pulse)	IRIS-PWM	Iris motor drive output .
29	-----	-----	LD-JIG	Not used. Open.
30	O	(Pulse)	ZOOM-LED	Output pulses to drive the ZOOM LED in the lens block via Q1201 (LED DRIVE).
31	-----	-----	TXD2	Not used.
32	-----	-----	RXD2	
33	O	(Pulse)	FCUS-LED	Output pulses to drive the FOCUS LED in the lens block via Q1201 (LED DRIVE).
34	O	Hi/Lo	ZDCW	Issues a command which determines with IC1301 (ZOOM MOTOR DRIVE).
35	-----	-----	ZD-PWMA	Not used. Open.
36	O	Hi/Lo	RDCW	Issues a command which determines with IC1302 (FOCUS MOTOR DRIVE).
37	-----	-----	RD-PWMA	Not used. Open.
38	I	(Pulse)	FV	Receives the vertical sync pulses that detect the iris detection area, from IC1121 (CAMERA DSP).
39	I	(Pulse)	FUS-SENS	Focus motor position detection input.
40	-----	-----	----------	Not used. Open.
41	I	(Pulse)	ZOM-SENS	Zoom motor position detection input.
42	-----	-----	GND	Ground.
43	O	0V-5V	HAL-ADJ1	Controls the offset voltage of IC1351 (F.DET/IRIS DRIVE).
44	O	0V-5V	HAL-ADJ0	Drives bias generator in IC1351 (F.DET/IRIS DRIVE) via Q1351 (BIAS DRIVE) to control the bias voltage of the Hall devices.
45	-----	-----	----------	Not used. Open.
46	I	0V-3V	ZOOM-SW	Not used.
47	I	0V-3V	FOCUS-SW	
48	I	0V-3V	KEY1	
49	I	0V-3V	TEMP-ADJ	Temperature change detection input. Detects variations in the forward voltage at the connected diode to correct the back-focus.

Pin No.	I/O	Active Level	Abbreviation	Function
50	I	0V-3V	V-GYRO	Not used. Connect to ground.
51	I	0V-3V	H-GYRO	
52	I	0V-3V	FDET	F-value detection input. Receives the F.DET voltage detected by IC1351 (F.DET/ IRIS DRIVE) and compares this with the reference voltage input via pin 53 to detect the F-value.
53	-----	-----	AVCC	Reference 3V power input.
54	-----	-----	AVCC	A/D reference voltage input (connected to 3V power supply).
55	-----	-----	VCC	3V power input.
56	-----	-----	VCC	
57	-----	-----	----------	Not used. Open.
58	-----	-----	----------	Not used. Connect to ground.
59	I	Lo	SYS-REST	Reset signal input from IC1203 (RESET PULSE GEN.).
60	-----	-----	VCC	3V power input.
61	-----	-----	STBY	Not used. Connect to 3V power supply.
62	-----	-----	VCC	3V power input.
63	-----	-----	----------	Not used. Open.
64	-----	-----	GND	Grounded.
65	I	(Pulse)	SYS-CLK	Inputs control clock pulses from IC1121 (CAMERA DSP).
66	I	Lo	FWE	Not used.
67	I	Hi	MD2	
68	-----	-----	----------	Not used. Open.
69	O	Hi	HALL-G	Controls the amplification (gain of Hall device) of IC1351 (F.DET/IRIS DRIVE).
70	-----	-----	----------	Not used. Open.
71	-----	-----	----------	
72	I	(Pulse)	HD	Inputs horizontal sync from IC1121 (CAMERA DSP).
73	-----	-----	SHUT-CTL	Not used. Open.
74	-----	-----	STROBE	
75	I	(Pulse)	FP	Inputs field discrimination pulse from IC1121 (CAMERA DSP).
76	O	(Pulse)	SD (232C)	Used for initial settings and adjustment. For data communications with personal computer.
77	I	(Pulse)	RD (232C)	
78	I	(Pulse)	EP3	Receives pulses which discriminate the iris detection area.
79	-----	-----	----------	Not used. Open.
80	-----	-----	----------	
81	-----	-----	----------	
82	-----	-----	----------	
83	O	(Pulse)	SDO	For data communications with IC1121 (CAMERA DSP), IC1202 (EEPROM).
84	I	(Pulse)	SDI	
85	O	(Pulse)	SCLK	
86	-----	-----	DC-LIGHT-SW-OFF	Not used. Open.
87	-----	-----	----------	
88	I	Hi	4800SET	Not used.
89	O	-----	LIGHT-SW	Not used. Open.
90	I	Hi/Lo	COLOR-BW	Color model and B/W model select input. (Hi: Color model/Lo: B/W model)
91	-----	-----	----------	Not used. Open.
92	I	Hi/Lo	F-DIAL1	
93	I	Hi/Lo	F-DIAL2	
94	O	Hi/Lo	LIGHT-O	
95	O	Hi/Lo	NTPL	
96	O	(Pulse)	CLK-CDS	Transfer data to IC1101 (CDS/AGC & A/D CONV.).
97	O	(Pulse)	SDO-CDS	
98	O	(Pulse)	CS-CDS	Activates data communications with IC1101 (CDS/AGC & A/D CONV.).
99	O	(Pulse)	CS-EE	Activates data communications with IC1202 (EEPROM).
100	O	(Pulse)	CS-EENT	Not used. Open.

HITACHI

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